

VOLUME 2

PUBLISHED NOVEMBER 1982

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Secrets of Satellite TV.

®

EXCITING
UPDATED
SATELLITE
MATERIAL

CONFIDENTIAL
FACTUAL
REPORT

BY ROD JOHNSON

PRICE \$20.00

IMPORTANT: READ THIS FIRST

The information in this book is not to be used to exceed FCC specifications. Subscribing to the services of the Satellites is highly recommended. If you are not familiar with this field, it is better to check with a known dealer of satellite earth terminals for more information.

SATELLITE ASSOCIATED TECHNOLOGY
Interfirst Bank Tower
Suite 612
222 E. Van Buren
Harlingen, Texas 78550

SECRETS OF SATELLITE TV
Volume Two
Published November 1982

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SATELLITE ASSOCIATED TECHNOLOGY
2135 North 77 Sunshine Strip
Harlingen, Texas 78550

It is with great appreciation and friendship that I wish to thank Joe Valentino for his help and inspiration for making possible SECRETS of SATELLITE TV VOLUME TWO. Also, I would like to thank Frank Strubhart for his dedicated work toward this goal. This book is dedicated to these gentlemen. Also to my wife Dottie who put up with me working so many late hours.

INTRODUCTION

SECRETS OF SATELLITE TV is dedicated to dealers and installers of TVRO systems and related equipment.

I've spent years in the TVRO field and I'm sure you'll agree with me that it's high time someone wrote a book "from the trenches!"

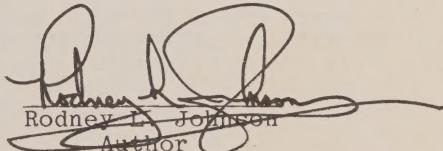
SECRETS OF SATELLITE TV is an in-depth factual report of information gleaned from dealers such as yourself who have struggled, and **survived**, "the growing period" in this field. In all likelihood, you'll find a single page in this book which makes it more than worth the purchase price in terms of the time and money it saves you.

SECRETS OF SATELLITE TV covers the experimental, the controversial, even the bazaar stages of satellite television's development and gives you practical advise which enables you to avoid time-consuming confusion.

Selling earth terminals is one business; installing and servicing them is quite another. SECRETS OF SATELLITE TV covers both aspects and **alerts you** to areas where the margin for error is slim and the chance of damaging a costly dish is high. Reputations are made through attention to detail and the avoidance of costly mistakes. And, as we all know, your reputation precedes you. Be the **BEST** when you sell TVRO and your business will prosper. This book will help you Be The **BEST**.

If someone is fishing with a yellow lure and hauling in the catch, you're likely to try a yellow lure yourself. SECRETS OF SATELLITE TV contains the yellow lure you're looking for.

Once you've read SECRETS OF SATELLITE TV and put it to profitable use, make notes on the pages provided at the end of the volume and don't hesitate to phone or write me with further suggestions to make all our businesses more successful.



Rodney L. Johnson
Author

A LETTER FROM THE AUTHOR

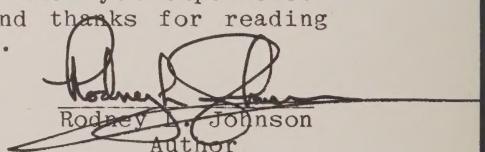
I gained my experience in satellite communications through twelve years in microwave and satellite technology with the United States Navy. My writing career spans the publication of ten previous books, all dealing with electronics, from CB radio to satellite communications. I write from field experience, from the trenches, from notes kept while designing, installing and servicing earth stations throughout Texas. And I welcome letters of suggestion or comment concerning these books.

SECRETS OF SATELLITE TV, Volume 1 dealt with the construction of antennas, circuit boards and so forth. From letters I received, I soon realized that the industry sorely needed a handbook, written from "hands on" experience, and written with the dealer/serviceman in mind.

South-central and South Texas sit a considerable distance from the center of the "satellite footprint." Far from being a detriment, our position on the globe forces us to experiment and improvise and gives us the opportunity to discover what works and what does not work in our area. These "tinkerings" lead to improved equipment and technology.

Meanwhile, our business seems to me to be, at times, cut-throat. When people stoop to placing unrealistic prices (such as \$395.00 for a dish -- this was at the 1982 Ft. Worth Show) on their gear, it makes it difficult for those of us who know the TRUE COST of quality equipment to place it with the consumer, and it tarnishes the reputation of satellite TV as a whole. With this in mind, I have decided to include the list prices of some systems in this book to give you comparisons on which to make educated marketing decisions. A customer will quickly forget the "cheap" price he paid for his dish when he doesn't get satisfaction from it.

Please feel free to contact me with comments on any "installation hints and/or kinks" you experience. I wish you all great success, and thanks for reading SECRETS OF SATELLITE TV, Volume 2.



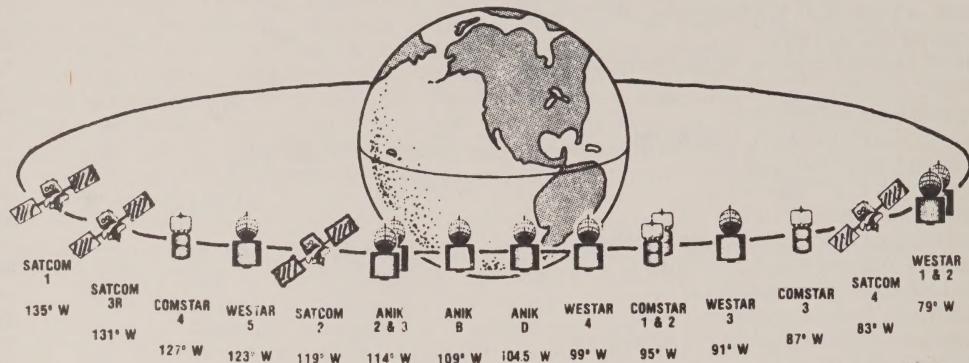
Rodney L. Johnson
Author

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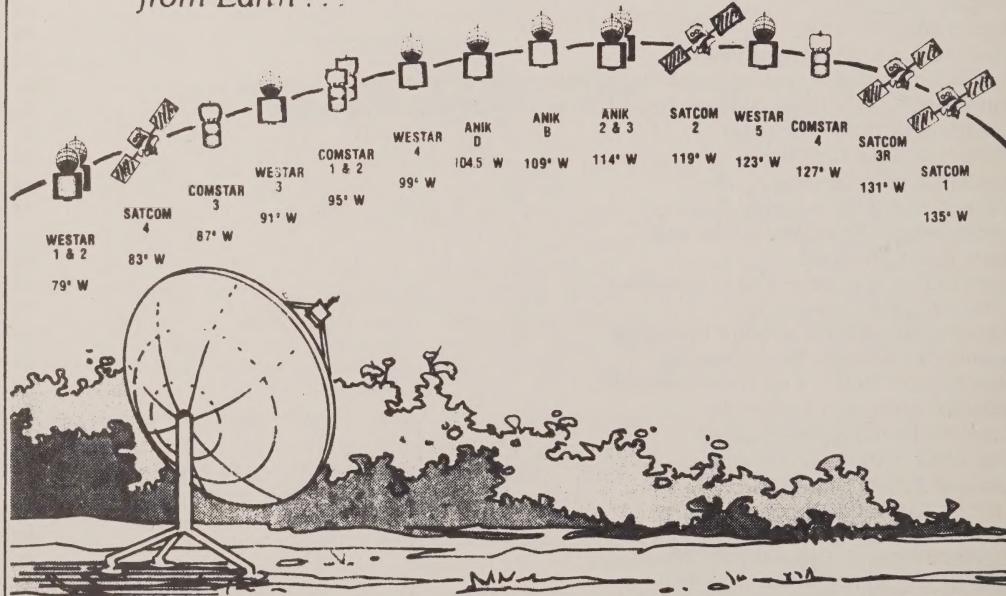
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Charting The Satellites

from Space . . .



from Earth . . .



*

SATELLITE CHANNEL CHART courtesy of Westsat Communications

SATELLITE PROGRAMMING AVAILABLE

This is a listing of satellite programming which was available as of late 1982. These listings are frequently updated.

LEGEND

Satellite	Designation	Location
Satcom 5	F-5	130° W
Satcom 1	F-1	135° W
Satcom 3R	F-3	131° W
Comstar D-4	D-4	127° W
Westar 5	W-5	123° W
Satcom 2	F-2	119° W
Anik 2 & 3	A-2/3	114° W
Anik B	AB	109° W
Anik D	AD	104° W
Westar 4	W-4	99° W
Comstar 2	D-2	95° W
Westar 3	W-3	91° W
Comstar 3	D-3	87° W
Satcom 4	F-4	83° W
Westar 1 & 2	W-1/2	79° W

01 [D3]	-----	NBC Network (East)
01 [F3]	-----	Nickelodeon
01 [F3]	-----	Alpha Repertory TV Service (ARTS)
01 [A2/3]	-----	BCTV-TV, Vancouver, BC
02 [F3]	-----	People That Love (PTL)
03 [F3]	-----	WGN-TV, Chicago
03 [W5]	-----	WOR-TV, New York
04 [F3]	-----	Spotlight, Santa Monica, CA
05 [F3]	-----	The Movie Channel
06 [F3]	-----	WTBS-TV, Atlanta, GA
06 [F4]	-----	Bravo
06 [W4]	-----	XEW-TV, Mexico
07 [F4]	-----	National Christian Network
07 [F4]	-----	Escapade (Playboy Channel)
07 [W5]	-----	CBS Cable, New York
07 [F3]	-----	Entertainment & Sports Network (ESPN)
07 [A2/3]	-----	CHCH-TV, Hamilton, ON
08 [F3]	-----	Christian Broadcasting Network
08 [F4]	-----	The Entertainment Channel

SATELLITE PROGRAMMING AVAILABLE

Continued

This is a listing of satellite programming which was available as of late 1982. These listings are frequently updated.

09 [F3] ----- USA Cable Network
10 [F3] ----- Showtime (West)
10 [W5] ----- Black Entertainment Network
11 [AB] ----- CBC-TV North, Toronto, Ont.
11 [W5] ----- Satellite News Channels
11 [F3] ----- Music Television
11 [F2] ----- Learn Alaska TV Net
12 [F3] ----- Showtime (East)
13 [D3] ----- ABC Network (East)
13 [F3] ----- Home Box Office (West)
14 [F3] ----- Cable News Network
15 [F3] ----- Cable News Net Headline
15 [AB] ----- CBC-TV, French, Montreal, QU
15 [A2/3] ----- TCTV-TV, Montreal, QU (French)
15 [W4] ----- Public Broadcasting System
16 [F3] ----- Appalachian Community Service Net
16 [F3] ----- Good Stuff
16 [F3] ----- Home Theatre Network Plus
16 [W4] ----- Spanish International Network (SIN)
17 [D3] ----- CBS Network (East)
17 [F3] ----- Cable Health Network
17 [F4] ----- Trinity Broadcasting Net, Santa Ana, CA
17 [W4] ----- Public Broadcasting Systems
18 [W4] ----- Select TV
18 [W4] ----- Financial News Net. (FNN)
19 [F3] ----- C-Span
19 [F4] ----- American Movie Network
19 [W4] ----- EWTN-TV, Birmingham, Alabama
19 [W4] ----- EROS
19 [AB] ----- CBC-TV, English, Toronto, OT
19 [A2/3] ----- CITV-TV, Edmonton, Alberta
20 [F3] ----- Cinemax (East)
21 [F3] ----- Weather Channel
21 [W4] ----- Public Broadcasting Systems
22 [F3] ----- Modern Satellite Network
22 [F3] ----- Daytime
22 [F3] ----- USA Blackout Channel
22 [W4] ----- Satellite Programming Net
23 [F3] ----- Cinemax (West)
23 [W4] ----- Public Broadcasting Systems
23 [F2] ----- Alaska Satellite Project
23 [A2/3] ----- CBC, French
24 [F3] ----- Home Box Office (East)
24 [W5] ----- Black Entertainment TV
24 [W4] ----- Galavision (Spanish)

WHERE TO BUY YOUR PROGRAM GUIDES

HOME USE:

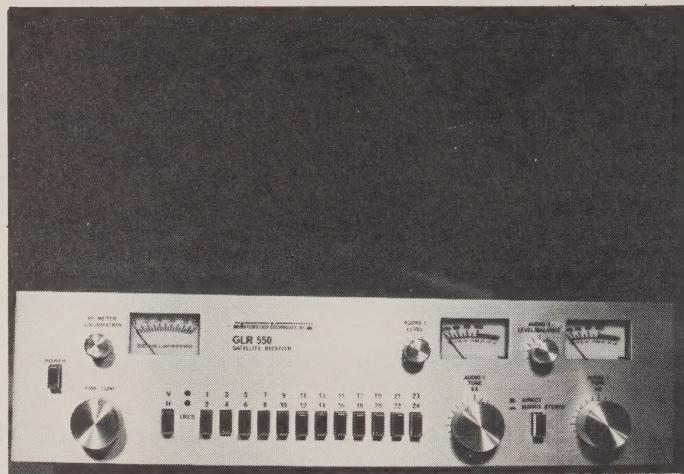
1. Contact: Channel Guide Telephone No. 1-800-323-1718
24 hour/day. 51 issues for \$48.00 per year. (Excellent
for customer use since it arrives faster than other guides.)
2. Contact: Satellite TV Week Telephone No. 1-800-358-9997
(Calif. No. 707-725-2476) Send \$1.00 for sample to:
Satellite TV Week
P.O. Box 308
Fortuna, Calif. 95540
\$48.00 per year payable in advance. (Excellent)
3. Contact: Westsat Communications Telephone No. 415-846-7380
For sports guides, baseball, football, etc., this publication
is best. \$19.00 per year payable to:
Westsat Communications
P.O. Box 434
Pleasanton, Calif. 94566

DEALERS:

1. Contact: Satellite Orbit Guide for Dealers Only.
Includes advertisements and other pertinent dealer information.
\$48.00 per year payable to:
Satellite Orbit
P.O. Box 1700
Hailey, ID. 83333



GLR 550--A Great Little Receiver!



On a Central Texas ranch recently, I installed two receivers 1,650 feet from the dish alongside a 180 foot Rohn 25G television tower and provided automatic satellite-to-satellite capability. The client wanted to be able to select odd and even channels on either receiver simultaneously.

I chose the Automation Techniques GLR 550 because it produced the best picture for the money and it was the only receiver I found which would work over that huge distance.

Note that the Horizontal and Vertical switch for rotating the Low Noise Amplifier (LNA) is located near the fine tune control. The stereo function works very well and is a pleasing surprise to the client. I am personally quite proud of Automation Techniques; especially their service department.

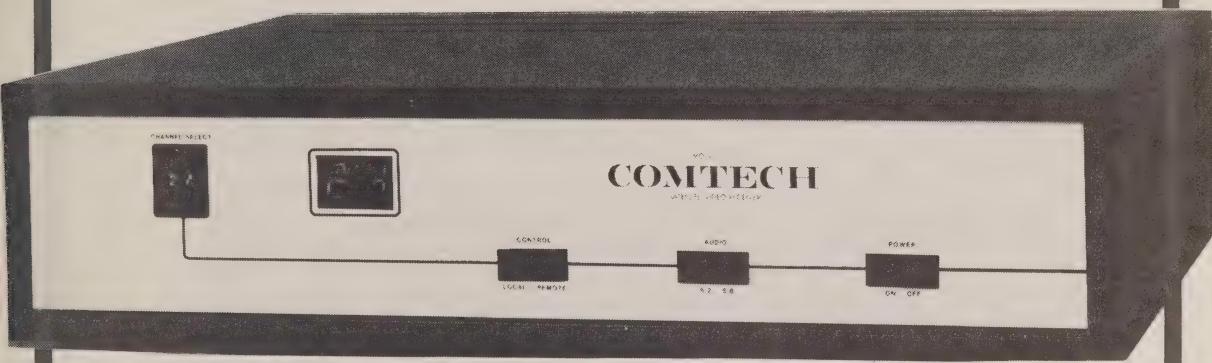
If any dealers reading this have installed a receiver this far from a dish, I would like to hear from you.

MODEL 650

COMTECH

SATELLITE VIDEO RECEIVER

- ANTENNA MOUNT
- BROADCAST QUALITY PICTURE
- HIGH RELIABILITY
- LNA POWER SUPPLY
- 24 CHANNEL LED READOUT
- 6.2/6.8 MHz PROGRAM DEMOD
- REMOTE CONTROL OPTION
- DC BLOCK



The Comtech Model 650 is an antenna mount receiver designed with the user in mind. Among the features which make this a unique receiver are the remote control capability, digital channel select, and a self-contained LNA power supply. These are only a few of the features which make the Comtech receivers the finest that money can buy.

There is no doubt of the channel you are looking at with a Comtech. The channel select allows you to set your channel and read it on your LED readout.

The MGC/AGC switch, control and test point permit you to align the antenna to insure optimum antenna positioning. Included as a standard feature is the 6.2/6.8 MHz PGM demod. Optional demods permit you to expand your capabilities. Also included as a standard feature is a D.C. Block for operation of a cable powered LNA, and if your requirement is for an LNA with a standard power cable, the 650 has an external voltage for that need.

When your system requirements dictate a top quality video receiver, the Comtech Model 650 will fill that need.

DECIDING WHAT SYSTEM TO SELL

Satellite Communications, like any industry, has its share of "fly-by-night" operators. They strike quickly with "price slashing" approaches which cause no end of difficulty for the legitimate dealer/installer.

Earth (or "down-link") stations should, naturally, bring the dealer a reasonable profit. Within his profit margin, the dealer should provide for normal maintenance and/or "glitches" which may occur during the initial installation. The competition may be selling in two directions at once - **cheap** and **quantity** - but this should never deter you from pushing the more expensive systems.

Why? Simple. You're selling **QUALITY!** Experience has taught me that selling in the \$8,000 to \$10,000 range is actually easier than selling the "cheapo's." First, you are appealing to the "five per-centers," that group of people who have money in "Anytown, USA." Certainly, even these monied clients are price conscious, but, more than that, they're "quality oriented" as well. Secondly, these customers are going to be **satisfied** with a good system and they're going to make the best "referral customers" you're ever going to get!

Typically, we find it is often advisable to initiate service with a system such as the Apollo X10 from National Microtech, Inc. and sell it for approximately \$4,980 -- installed. This gives the customer the option of installing an automatic remote satellite finder at a later date. Note: We generally install the lines for the automatic system just in case the customer exercises that option. This allows the dealer/installer to gain a customer at the entry level. Automatic remote finders ordinarily sell in the \$1,250 to \$1,500 range -- installed.

Naturally, when selling equipment in this price range, it pays to have your act together. Approach the client in a professional manner. I prefer to schedule demonstrations by telephone first, and set them in the evening hours when both the husband and wife are available. Occasionally, either spouse can make the decision, but it makes sense to avoid making a demonstration twice, if possible. Furthermore, bear in mind that the wife often has the checkbook.

SATELLITE TELEVISION.....
IT'S BEGINNING...IT'S GROWTH...

It is always best to tell your customer how satellite TV began; especially when he is already "eyeing" you to establish in his mind that you know what you are talking about. When you are confident of yourself, your customer will be also.

As early as 1957, Sputnik I was the first successful satellite that transmitted telemetry information. Later, many more communications satellites were to follow. Then, in 1963, Syncom 2 and 3 were successfully launched into the first synchronous or geostationary orbit. The geostationary orbit was first purposed by the British author scientist Arthur C. Clark who proposed that at approximately 23,000 miles above the equator a satellite would achieve geostationary orbit with the earth since its revolutions around the earth would be about the same as the earth's rotation. Each satellite could cover about 40% of the earth's surface without any concern for the earth's curvature. Today there are many stationary TV and communication satellite systems.

With rural America needing TV in areas where cable could never reach, not to mention new housing developments, condominiums, motels and apartments, You are looking at a very explosive market.

Where do you fit in?



Who said that satellite "dishes" don't multiply? First dish in the background was sold; two weeks later a neighbor also bought a 10 foot automatic system. 10 foot (automatic) turnkey sold for \$7,500.00 plus tax. Both dishes sold and installed by SATELLITE ASSOCIATED TECHNOLOGY.

LOCATING THE DISH SITE

Choose your site of your "dish" very carefully. Location should be as close as possible to the place where main receiver is to be located. These are the reasons:

1. Less Cost
2. Less time to install
3. Best picture results

Some customers will ask to install their antenna on the roof or on a hill top. This should only be a last resort! The high locations cause interference from terrestrial microwave paths not to mention structural problems with mounting on the roof.

In the midwest, choose an unobstructed view of the southwest sky approximately 43° above the horizon.

HEAVY FOLAGE OR TREES CAN CAUSE DEGRADATION OF YOUR SIGNAL.



TRS-80 POCKET COMPUTER
EL/AZ PROGRAM FOR SATELLITES

In the PRO mode enter:

```
10: Print "satellite"
20: Print "el/az angles"
30: Print "sat lat = ? "
40: Print "(Nt, S-)"
50: Input A
60: A=DEG A
70: Print A
80: Print "site long = ?"
90: Print "(Et, W-)"
100: Input L
110: L=DEG L
120: Print L
130: Print "Sat Long = ?"
140: Print "(Et, W-)"
150: Input F
160: F=DEG F
170: Print F
180: B = L - F
190: K = ATN (TAN B/SIN A) + 180
200: Print "AZIMUTH"
210: Print K
220: C=ACS (COS B*COS A)
230: S=✓((COS C* - 5,36954*10^8) + 1,81859*10^9)
240: E = ACS ((5^2 - 1,7375*10^9)/(S*12734)) - 90
250: Print "ELEVATION"
260: Print E
270: END
```

NOTE: With minor program modifications, this program may be used with any home computer that programs in basic.

To use program, go to the "run" mode. Type (RUN-ENTER)
When the TRS-80 prints site lat = ? (Nt, S-), enter the receive site latitude using + xx.xxxx for south latitudes. When TRS-80 prints site long=? (Et, W-) enter the site longitude using + xxx.xxxx for east longitudes and -xxx.xxxx for west longitudes. The latter instructions apply also to Sat. Long.= ? (Et, W-).

NOTE: To enter lat & long:

EXAMPLE: 26° 30' 15" N. enters as .26,3015
97° 20' 30" W. enters as -97.2030

SAT. DISH EL-AZ ANGLES
HP-29C OR OTHER H-P PROGRAMMABLES

INSTRUCTIONS:	1. Input GND. STA. LAT. (Nt, S-)	GSB1
	2. Input GND. STA. LONG. (Et, W-)	GSB2
	3. Input SAT. LONG. (Et, W-)	GSB3
	4. Calculate Az	GSB4
	5. Calculate EL	GSB5

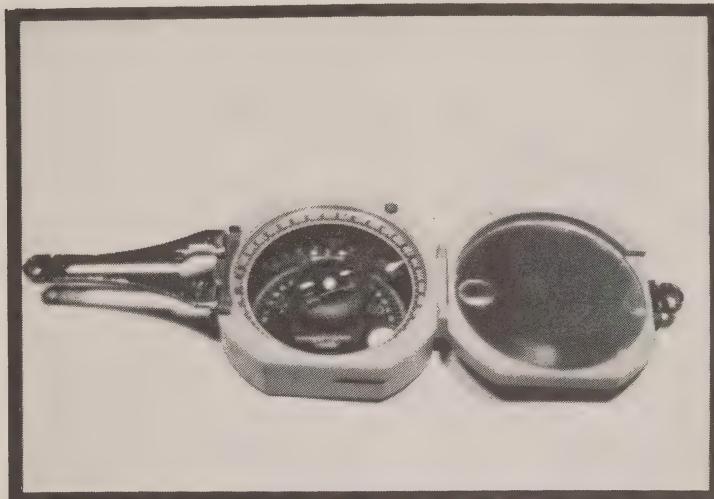
PROGRAM:

1. LBL 1	21. TAN-1	41. 9	61. 1
2. →H	22. 1	42. 5	62. .
3. STO 1	23. 8	43. 4	63. 7
4. RTN	24. 0	44. CHS	64. 3
5. LBL 2	25. +	45. EEX	65. 7
6. →H	26. RTN	46. 8	66. 5
7. STO2	27. LBL 5	47. X	67. EEX
8. RTN	28. RCL 2	48. 1	68. 9
9. LBL 3	29. RCL 3	49. .	69. -
10. →H	30. -	50. 8	70. RCL 4
11. STO 3	31. COS	51. 1	71. 1
12. RTN	32. RCL 1	52. 8	72. 2
13. LBL 4	33. COS	53. 5	73. 7
14. RCL 2	34. X	54. 9	74. 3
15. RCL 3	35. COS-1	55. EEX	75. 4
16. -.	36. COS	56. 9	76. X
17. TAN	37. 5	57. +	77. :
18. RCL 1	38. .	58. ✓	78. COS-1
19. SIN	39. 3	59. STO 4	79. 9
20. :	40. 6	60. X 2	80. 0
			81. -
			82. RTN

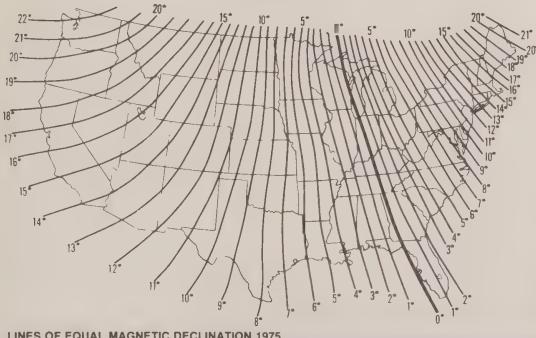
If you have any questions about computer location of satellites
contact:

Ben Whitenburg, Jr.
1614 E. Jackson
Harlingen, Texas 78550
Tel: 512-428-5865

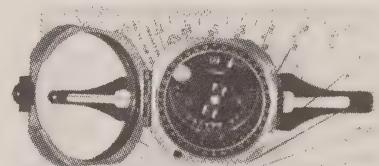
BRUNTON POCKET TRANSITS



ISOGONIC CHART
E — DECLINATION — W



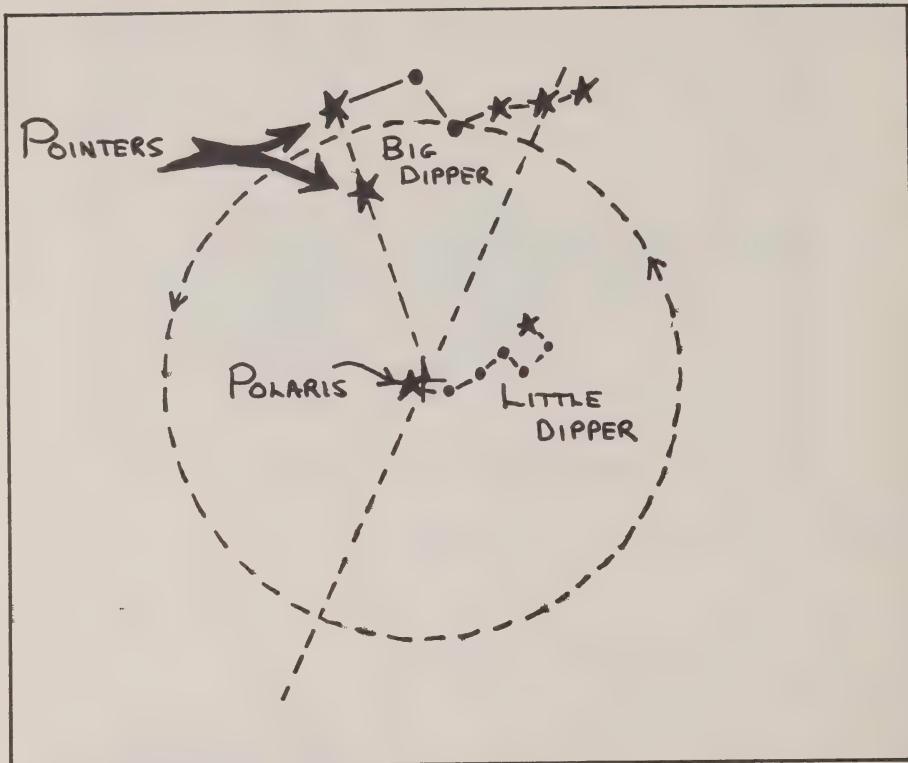
BRUNTON POCKET TRANSIT
The professional satellite
TV installers tool.



An excellent set of instructions come with this instrument. We have set mounts polar in less than three minutes with this instrument.

Cheaper instruments are available, but if you desire one like this enclose \$189.95 money order or cashiers check and we will ship you a Brunton Pocket Transit with carrying case. Send to: Satellite Associated Technology, Interfirst Bank Tower, Suite 612, 222 East Van Buren, Harlingen, Texas 78550.

HOW TO FIND POOR
MANS TRUE NORTH

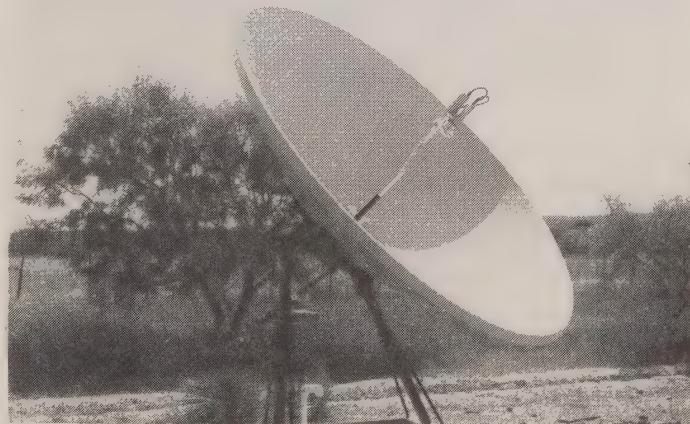
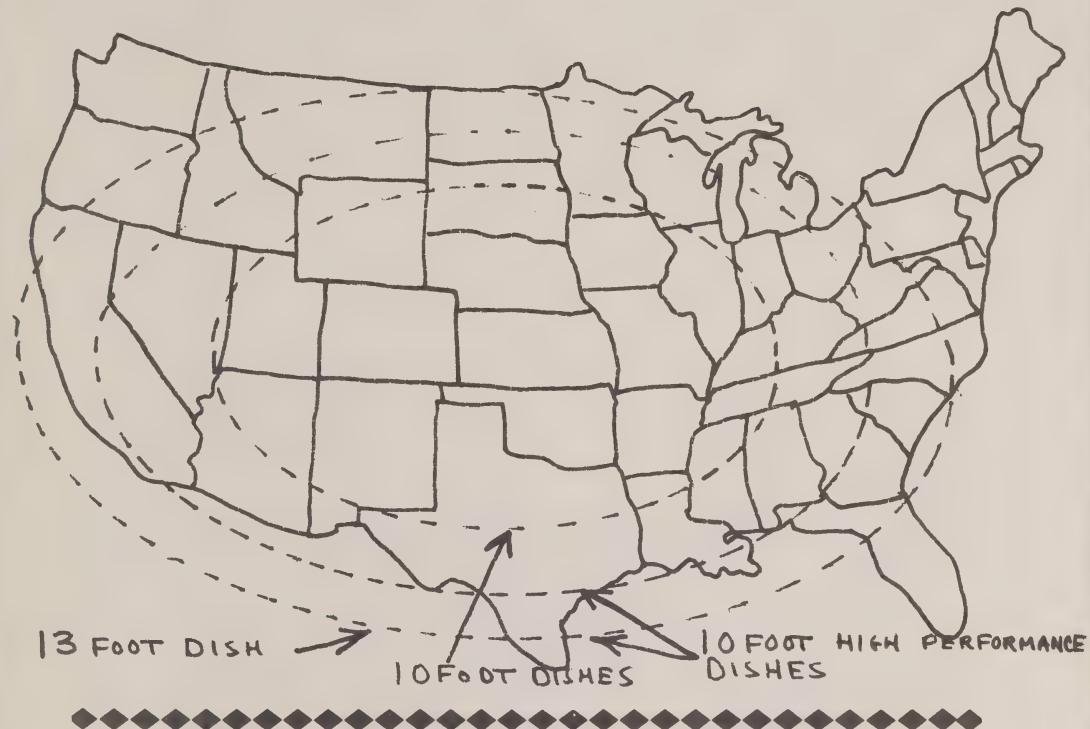


True north and north on the map will be two different points. Always calibrate the compass you use in your area for proper declination. In Mexico, the declination was so great that we did not trust the compass because of heavy mineralization in the area.

You will find that true north is almost right in line with Polaris or the North Star. You can use two sticks to sight Polaris. If you are using a uni-mount, this is usually not necessary. But you may want to calibrate your compass etc.....don't laugh.....IT WORKS!!!!

CHOOSING YOUR DISH SIZE

* Chart is for home use.



Apollo X10 installed on Central Texas ranch. Features dual feed, 2 receivers --- 1650' run (dish to receivers).

PUTTING THE "DISH" TOGETHER

Most dishes will come in "petals". Assembling a dish can sometimes be a real headache!! However, I hope that these helpful hints will save you time and money!

1. Bolt dish together upside down on a relatively flat surface. The inside is the most important. Make sure all seams are as even as possible. This will help the gain of your dish. If you are unable to get the seams flat with existing holes, drill new ones. Use of C-clamps is very helpful when assembling a dish. (Diagram A)
2. Turn dish over and install feed assembly. It is easier on the ground and much safer. Until you have seen a dish fall while standing on it, you may think it is just as easy as installing air!! If you do install the feed while the dish is installed on the mount, always brace the dish for safety purposes. Check the LNA support centering by putting a 5' piece of pipe, conduit or a broom stick through the hollow shaft of the rotor and slide it down until it touches the surface of the dish. It should be within 1" of the center dimple molded into each dish. If it is not, grasp the rotor motor and the centering stick and apply sufficient force to bend the aluminum tube that holds the rotor motor. Continue bending in small increments until the stick is centered on the dish when bending pressure is released. Generally, very little bending is required, only enough to make up for the warpage of the aluminum triangle due to the heat of welding. If the stick is initially more than 4" or 5" from the dish center, check to be sure that all the legs are properly seated in their sockets and the feet are properly located and mounted on the dish (Diagram B).
3. Installing the feed is sometimes the downfall of what otherwise would have been a good installation. I have seen holes drilled all over a dish trying to position a feed. Try these helpful hints (Diagram C).
4. After dish is assembled, it is best to have the mount assembled and bolts ready. If you are using a uni-pole type mount, position it as shown in Diagram D. Stand the dish on edge in

PUTTING THE "DISH" TOGETHER...cont.

front of pole with mount towards pole. Position the slip tube so that the least lifting and jockeying is necessary to pick up the dish and lower the slip tube over the unipole. (Make sure the locking bolts on the slip tube are loose.) CAUTION: STRONG OR GUSTY WIND CONDITIONS CAN MAKE THIS OPERATION VERY HAZARDOUS!! Make sure you have sufficient lifting devices and man power!



PICTURED IS WEST TEXAS RANCHER WILBURN EARDLEY
INSTALLING HIS OWN DISH.

BASIC INSTALLATION
OF TVRO
DIAGRAM A

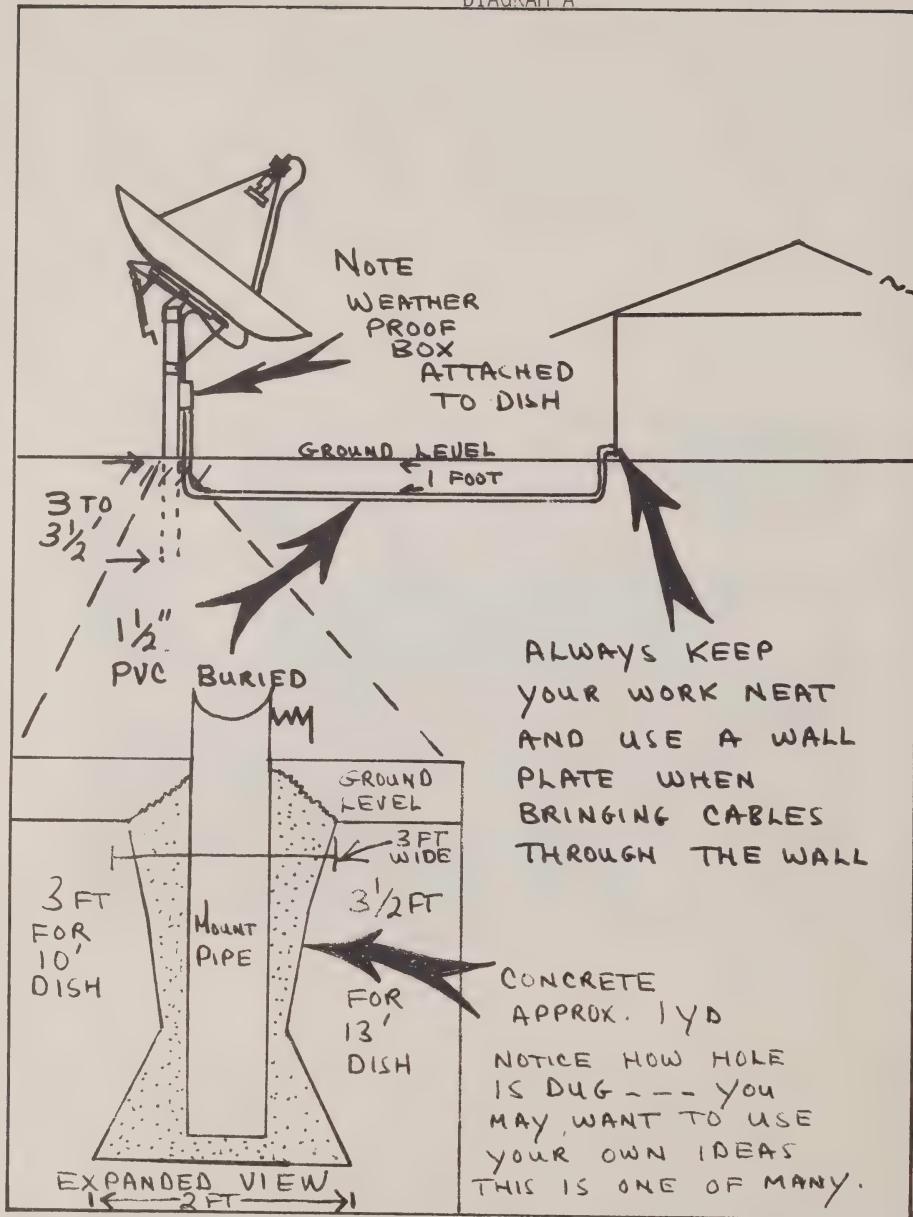


DIAGRAM A.

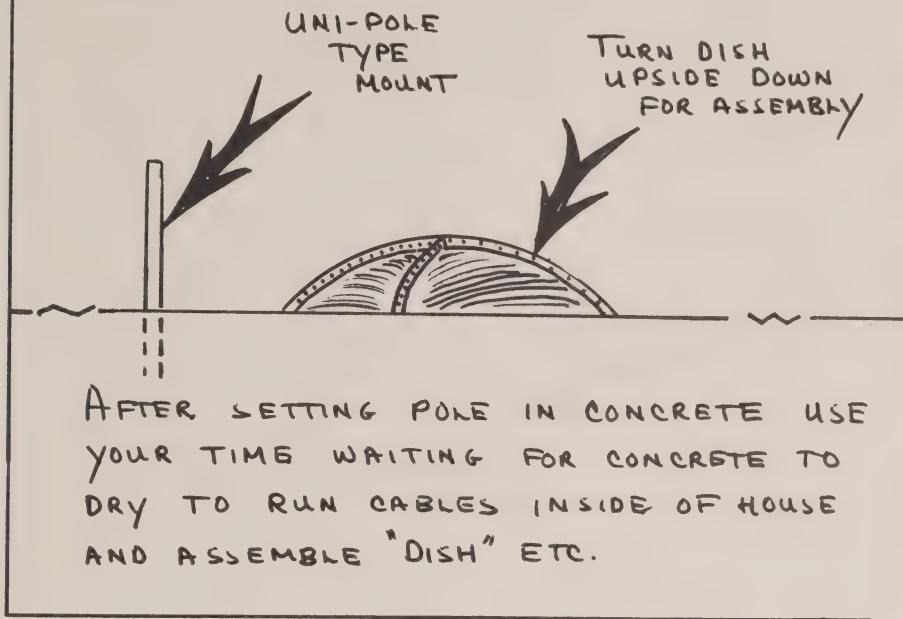
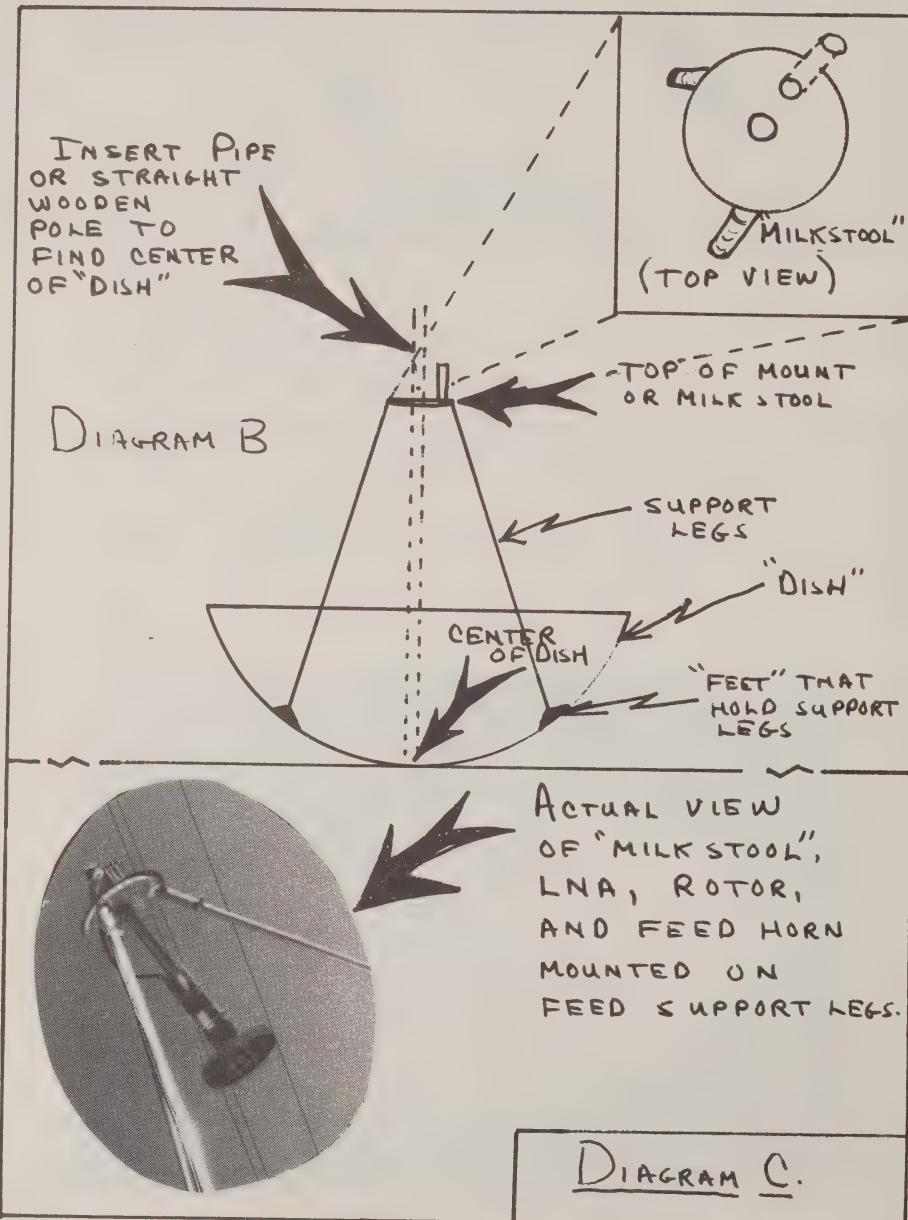
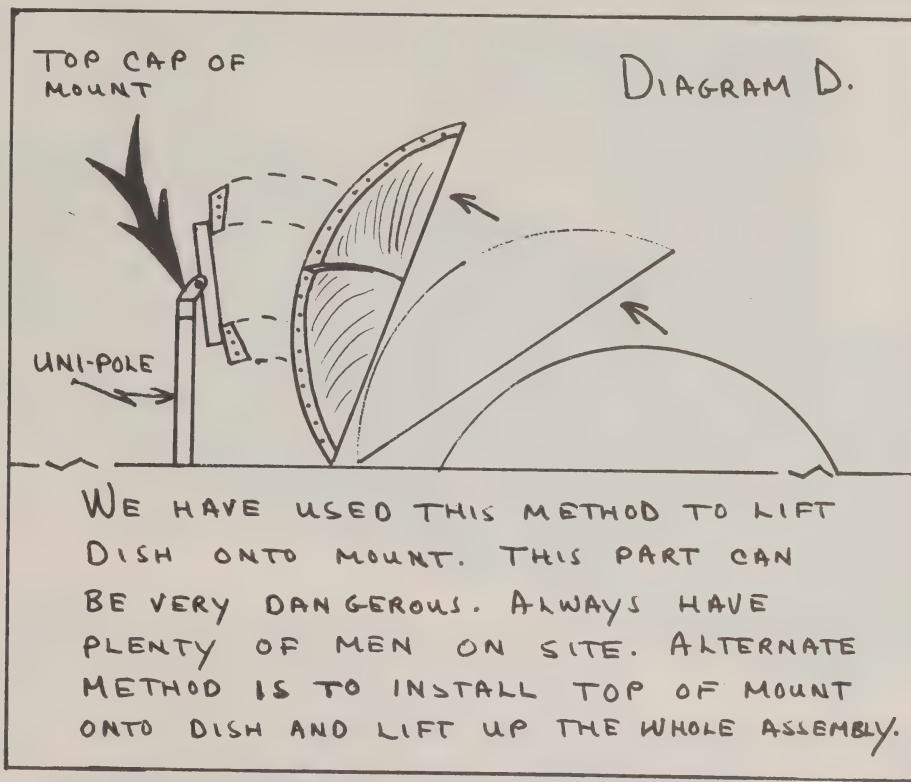


DIAGRAM B.

Putting your dish together continued.....



Putting your dish together continued.....



NEW PRODUCT RELEASE: THE MODEL 7600A SATELLITE RECEIVER



**IMAGE REJECT MIXER
(DOWN CONVERTER)**

TECHNICAL SPECIFICATIONS

- NEW temperature compensated oscillator for more reliable operation over a wider temperature range.
- Mounts at the antenna
- Uses low cost RG59-U cable
- Longer antenna to receiver runs possible
- Input frequency: 3700 to 4200 MHz (50 ohms)
- Output frequency: 70 MHz (75 ohms)
- Noise figure: 13 dB typical
- Image rejection: 15 dB typical
- Conversion gain: 18 dB typical

Model 7600A Features

- Receiver frequency range: 3700 to 4200 MHz
- Full frequency tunable audio for all subcarriers: 5 to 8 MHz
- Simplified channel tuning
- Built-in video modulator
- Improved video performance circuitry
- Automatic frequency control
- Signal strength carrier level meter
- Attractive all wood cabinet
- Definitive Gillaspie quality control

**The Model 7600A Satellite
Receiver System Package**

- Antenna mounted Image Reject Mixer (Down Converter)
- Built-in video modulator
- 100' of RG59-U cable
- 100' of Belden DC cable



Gillaspie & Associates

365 San Aleso Avenue, Sunnyvale, CA 94086 (408) 730-2500

Get The Last Word First!

APOLLO X10 - WHY DEALERS LIKE THEM



Using the Apollo X10, adjusting the focal length is much easier since it can be done from the back of the dish instead of crawling up a ladder in front of the dish.

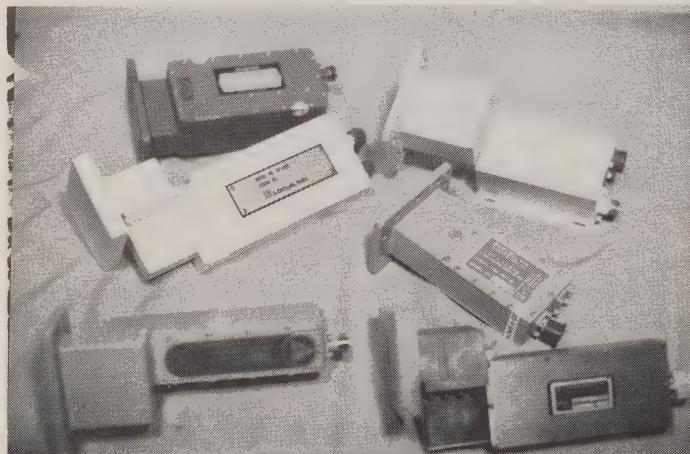
THE LNA (LOW NOISE AMPLIFIER)

The LNA (Low Noise Amplifier) is a very important part of a TVRO system. What used to cost a fortune was reduced with the onslaught of GaAs Fet (transistor). This allowed LNA's to be manufactured at a fraction of their original cost.

Since the signal is coming from space at only 5 watts to 8.5 watts of power, and covering an area larger than the United States, you can see we are asking a lot of a TVRO Earth Terminal to pick up such a "weak and tiny" signal. Even the earth itself radiates a stronger signal than is coming from the satellites we are talking about.

Without getting too technical ---you will probably use LNA's such as 120°, 110°, 105°, 100°, 90°, and 75°. LNA's are rated in degrees, or simply noise temperatures. The lower the noise temperature, the more expensive the LNA will cost. The most common LNA used is the 120°, however, a lot of dealers, especially in the southern part of the United States, use only 100° LNA's.

One problem is that some manufacturers sell LNA's that are "un-stamped". If you do not know the noise temperature of your LNA you may want to make sure the LNA has a Data Sheet describing the "specs". (See Noise Figure and Correlation Chart shown elsewhere in this book.)



LNA NOISE TEMPERATURE CORRELATION CHART

Here is a chart to help you make instant conversions for LNA's up to 500°K.

Noise Temperature in Degrees Kelvin to Noise Figure in dB					
T°K	NF dB	T°K	NF dB	T°K	NF dB
10	.148	175	2.056	340	3.378
15	.220	180	2.103	345	3.412
20	.291	185	2.149	350	3.446
25	.360	190	2.194	355	3.480
30	.429	195	2.239	360	3.513
35	.496	200	2.284	365	3.547
40	.563	205	2.328	370	3.580
45	.628	210	2.372	375	3.613
50	.693	215	2.415	380	3.645
55	.757	220	2.458	385	3.678
60	.819	225	2.501	390	3.710
65	.881'	230	2.543	395	3.742
70	.942	235	2.584	400	3.773
75	1.002	240	2.626	405	3.805
80	1.061	245	2.666	410	3.836
85	1.120	250	2.707	415	3.867
90	1.177	255	2.747	420	3.897
95	1.234	260	2.787	425	3.928
100	1.291	265	2.826	430	3.958
105	1.346	270	2.865	435	3.988
110	1.401	275	2.904	440	4.018
115	1.455	280	2.942	445	4.048
120	1.508	285	2.980	450	4.077
125	1.561	290	3.018	455	4.107
130	1.613	295	3.055	460	4.136
135	1.665	300	3.092	465	4.165
140	1.716	305	3.129	470	4.193
145	1.766	310	3.165	475	4.222
150	1.816	315	3.201	480	4.250
155	1.865	320	3.237	485	4.278
160	1.913	325	3.273	490	4.306
165	1.962	330	3.308	495	4.334
170	2.009	335	3.343	500	4.362

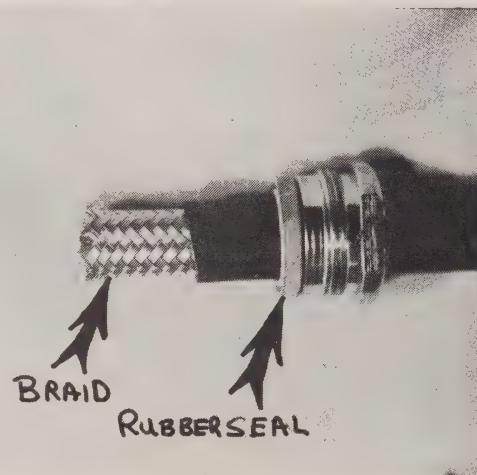
Example on how to use chart:

If you purchase an LNA, make sure you have a certified performance chart. For instance, to make sure you got your money's worth the 100° LNA should not have any high frequency noise figure higher than 1.291 on the performance sheet of your LNA.

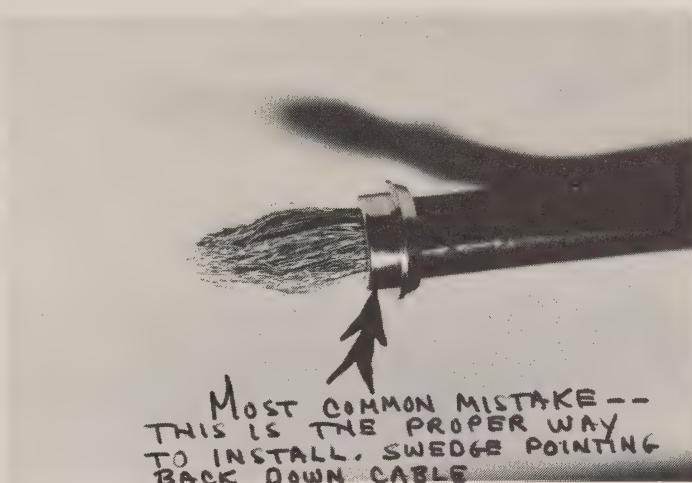
HINTS & KINKS ON INSTALLING THE "N" CONNECTOR



This may look unnecessary to some, but many LNA's have been damaged not to mention time lost by improper installations of "N" connectors.



Be sure to use an awl or small wire brush to separate braid or shield.



BRAID SHOULD
COME ALL THE
WAY TO CORNER
SEE A.

NOTE: SLOPED SECTION
DOWN.

C. A.

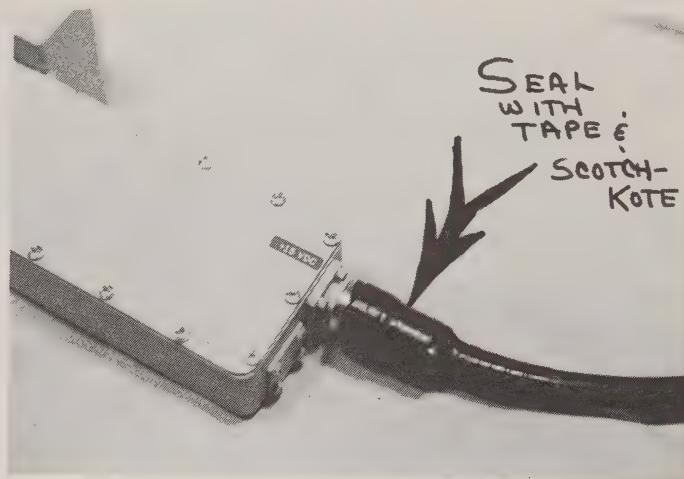
B.

TECH NOTE:

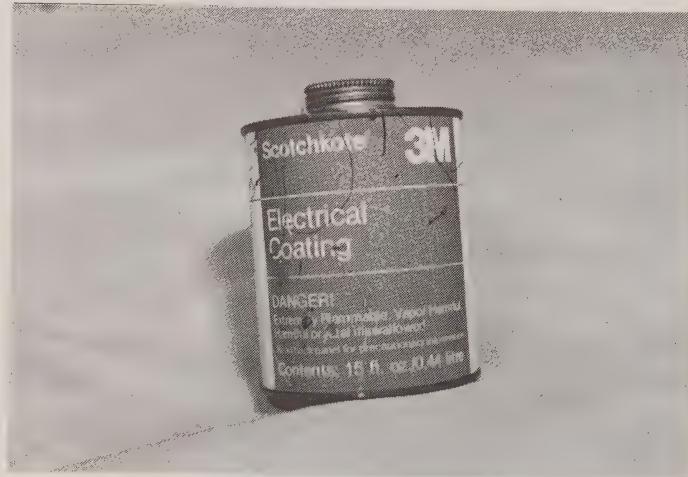
Be sure to seal "N" connector upon completion.

Another problem can result from having "C" too long. This will cause the "pin" to stick out too far which in turn will damage the connector on the LNA.

SEAL YOUR LNA
CONNECTION PROPERLY

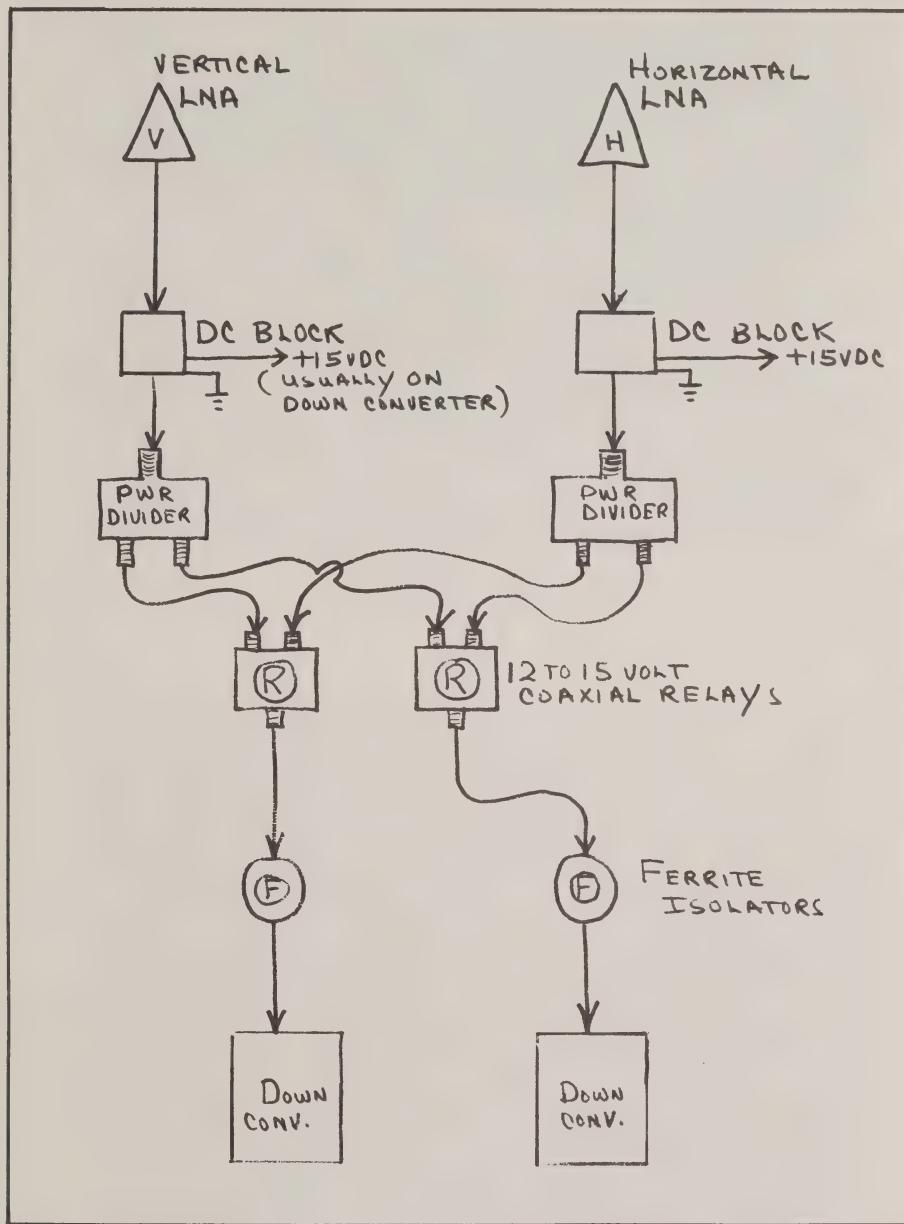


Seal with electrical tape then coat with SCOTCHKOTE.



SCOTCHKOTE is available from your local electrical supply house.
This is highly recommended by professionals in the field.

BLOCK DIAGRAM OF DUAL FEED SYSTEM



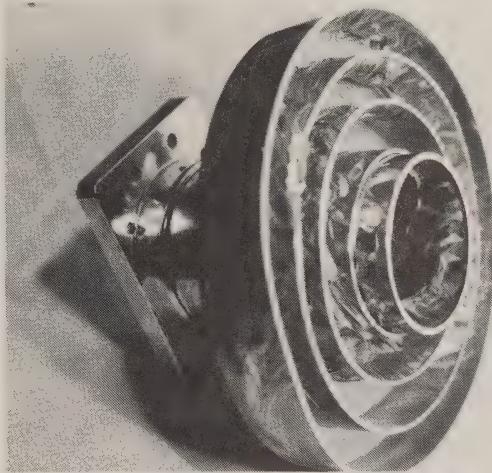
SETTING FORM AND POURING THE SLAB



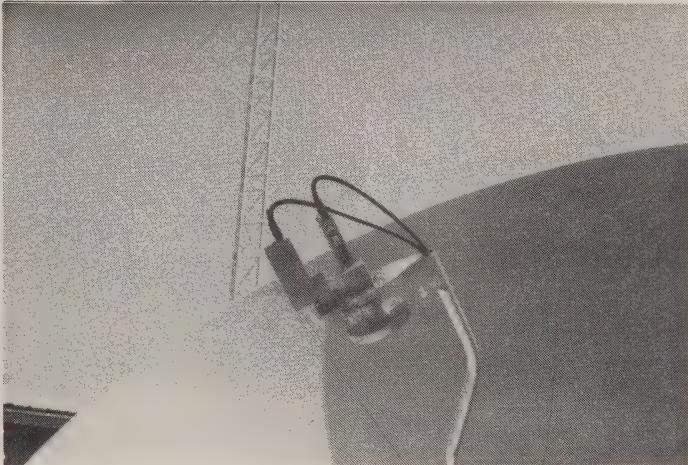
Use 3000 pound per square inch mix. 5'X 5'X 12" slab usually requires 1 1/2 yards or less.



CHOICE OF FEEDS



This part, the "feed", attaches directly to the LNA and faces down to the dish. As you can see the above feed melted from the heat created from a 13 foot dish. Since this was a "new idea" ---plastic feeds, we tried the units in the field and 10 out of 10 melted. It's a good idea, and maybe with improvements in the field of plastics a better model will be developed. We only use CHAPARRAL feeds. A noticeable increase in picture quality was also attained.



New CHAPARRAL dual feed hookup on Apollo X-10.

Two New Products from Chaparral:



POLAROTORTM DUAL FEED IITM

POLAROTORTM

Change Polarization without a Rotor, and with Performance that Equals the Chaparral Super Feed™. With the Chaparral Polarotor™, antenna polarity can be changed in less than half a second. Inside the circular waveguide of the Polarotor™, a probe is rotated by a small servo to any position over 180 degrees with one-degree accuracy. The feed and the LNA remain fixed. Only the probe moves.

DUAL FEED IITM

Performance and Economy, with Chaparral Quality

The Chaparral Dual Feed II™ applies an innovative design to produce a high-performance orthomode feed at low cost. For compact installation, both LNAs can be mounted to the rear. VSWR is better than 1.4/1, and isolation is at least 30 dB.

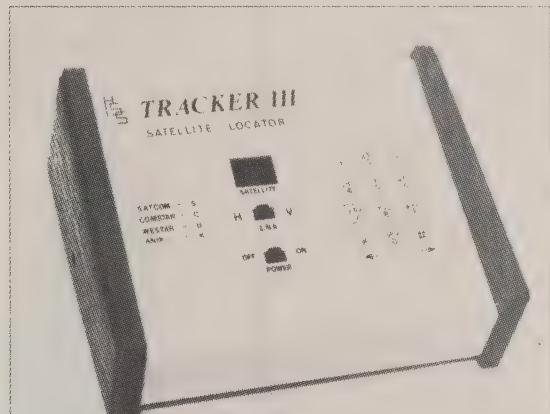


Chaparral Communications:
103 Bonaventura Drive, San Jose, CA 95134, (408) 262-2536

Chaparral: Innovative design, Imaginative engineering, Quality manufacturing.

INTRODUCING: TRACKER III

Advanced Microprocessor Technology
for the 80's



*Get the most out of your Earth Station with the Tracker III
The most dependable Satellite Locator your money can buy!*



TRACKER installed on H&R 13 foot "dish".

SYSTEM FEATURES

- Easily programmed for pinpoint stopping on all present and future satellites in the U.S. domestic satellite belt. (up to 70 programmable positions).
- Provides programmable horizontal and vertical polarization for each satellite position. (This allows programmer to compensate for "skew" across the arc.) Can be used with rotatable feed systems with Alliance rotors and Chaparral polarotors.
- LED digital display with actual satellite designation and tone to indicate when movement is complete. (also shows direction of dish travel with "chaser" line on LED display).
- Automatic overshoot correction.
- Automatically limited end stops.
- Manual override capability.
- Pre-programmed error codes to indicate improper satellite selection and actuator or rotor malfunctions.
- Memory Store with battery backup that will hold programming of satellites and polarity for the life of the battery pack.

- Programmable E-PROM that can be updated when more features become available. (this unit will never become obsolete).
- Microprocessor controlled with the latest TTL and C-MOS technology available.
- Compatible receivers can be used to control LNA rotation.
- DC low voltage power jack (actuator) with built-in Hall Effect sensor with adjustable saddle clamp to fit most polar mounts.
- Can be used with most any jack no matter what stroke you require. (18", 36 volt actuator provided as standard equipment)
- Can be adapted to most polar mounts.

OPTIONS

- Programmable rotation for the Chaparral polarotor.
- Hall Effect sensor can be easily field installed in your actuator.
- Motor power supplies from 12 - 120 volts AC or DC.



Star View CRAIG
Systems



STAR VIEW MODEL 12K

- Complete System
- Easy to Install
- Reasonably Priced
- UPS Shippable, weight 125 lbs
- More than 100 Channels Accessible

THE STAR VIEW 12K SYSTEM KIT CONTAINS:

- 12 Foot Antenna
- 24 Channel Receiver
- Feed Horn
- No Modular Included (May be ordered separately)
- Azimuth Elevation Mount
- 120° Low Noise Amplifier
- Cables & Connectors

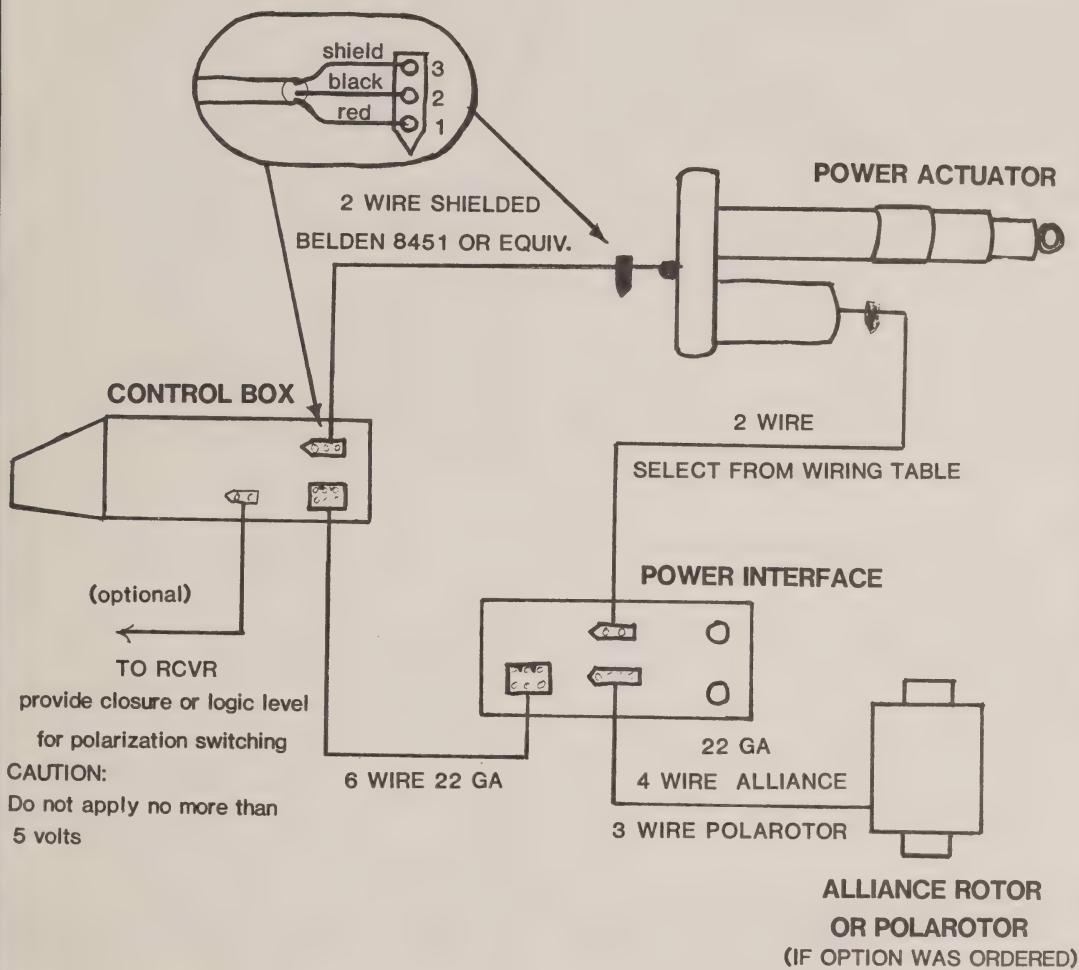
Available through your local Craig Star View dealer • Call or write for information • Dealership inquiries welcome • Price subject to change without notice.

H&R COMMUNICATIONS, INC.

Subsidiary of Craig Corp.
Route 3, Box 103G
Pocahontas, Arkansas 72455

Call 800-643-0102
or 501-647-2291

TRACKER III SYSTEM INTERCONNECT



All wiring should be terminated in the supplied Molex connectors. If you don't have a molex tool when installing these connectors, the tabs can be bent over the wire and soldered on the pins.

Make certain you do not cross wire the connectors, the wiring must be connected to the same pin number on each end of the cable.

SPECIFICATIONS/TRACKER III

70 Position Satellite Locator

CONTROL BOX

Controls

On/Off switch, LNA rotation with keypad for programming and satellite recall. Set normal switch recessed on rear panel.

Digital Display

Shows satellite programmed in memory at current dish position, LNA rotation, dish movement and direction of travel. Also will display errors for stalled LNA rotation, stalled jack motor, improper satellite entry.

Manual Dish Movement

Easily made by pressing appropriate keypad button for east or west movement, microprocessor automatically sets east/west limits based on most eastern/western satellite.

Stopping Accuracy

Limited by type of actuator used. Typically better than .075°.

Maximum Distance between Control Box and Power Interface

1500'

Required Wiring

Shielded pair between control box and jack sensor. (Belden 8451 or equivalent.)

Control box to power interface, 6 conductor 22 gauge unshielded.

Connections

Molex connectors on rear panel of control box, interface box, and sensor. Mating connectors supplied.

Sensor

Hall Effect sensor mounted within motor housing of jack can be field installed in most jacks.

Operating Voltage/Current

Control Box: 110 VAC

Power Interface: 36 VDC to jack
110 VAC input, 2 amps maximum

Output: 36 VDC to jack motor
(Other voltages available upon request for control and power interface.)

Size

Control Box: 8" W x 3 1/2" H x 7" D

Power Interface: 8 1/2" W x 3 1/2" H x 5 1/2" D

Weight

Control Box: 2 lbs.

Power Interface: 10 lbs.

ACTUATOR

Screw

Acme with dual thrust bearings

Dynamic Load

1000 lbs. maximum

Motor

36 volt D.C. with dynamic braking action

Finish

Zinc plated

Stroke

18" standard (13" to 52" available at additional cost)

Mounting bracket

7/8" ID tubing on inner tube

7/8" ID tubing on outer tube with adjustable "saddle" clamp

TRACKER III SATELLITE LOCATOR

PROGRAMMING INSTRUCTIONS

1. Turn power on and set LNA switch to H. The decimal point in the middle of the display will light.
2. With a small screwdriver move the recessed PROGRAM switch to the SET position.
3. Move the dish to Satcom 3R by pressing the "#" key or the "*" key. The "#" key should move the dish west and the "*" key should move the dish east. If the dish does not move in the proper direction reverse the motor wires. The display chaser will show dish movement and direction. If the dish fails to move or the sensor was improperly connected "E2" will be displayed with a long beep.
4. Enter "09" on keypad. This clears all memory and the display will be blank except for the decimal point.
5. Once Satcom 3R is found tune in a horizontal (even) channel. Press the "1" key and hold it down until "E1" is displayed. This will indicate the rotor has reached its limit and establish the starting point for LNA programming.
6. The "1" will move the LNA clockwise and the "3" key will move the LNA counter-clockwise. Use the "3" key to obtain a clear picture. Maximize signal strength by pressing the "1" or "3" key momentarily.
7. Set the receiver to a vertical (odd) channel. Move the LNA switch to the "V" position and immediately press the "3" key. Hold down the "3" key to obtain a clear picture. Maximize signal strength by pressing the "1" or "3" key momentarily.
8. Enter "S3" on keypad. This will program the dish position and LNA polarizations into the memory.
9. Move the dish to the next satellite to be programmed using the "*" or "#" key.
10. The TRACKER III will remember the last programmed LNA polarizations. If these need to be altered to compensate for skew then press "1" or "3" to maximize signal in the "H" or "V" positions.
11. Enter the satellite designation from the table below:

SATCOM 1, 2, 3, 4 = "S1", "S2", "S3", "S4"
COMSTAR 1, 2, 3 = "C1", "C2", "C3"
WESTAR 1, 2, 3 = "W1", "W2", "W3"
ANIK 1, 2 = "K1", "K2"

12. Repeat steps 9, 10, and 11 for all satellites.
13. Twelve-channel satellites may be programmed all horizontal if desired with LNA switch in "H" or "V".
14. When all satellites have been assigned, move the program switch to the normal position.
15. To recall any satellite, enter its assigned designation. When LNA and dish movement is complete TRACKER III will beep.
16. To change from horizontal to vertical move the LNA switch from "H" to "V". These programmed positions will then be recalled from the TRACKER III's memory.
17. After programming the dish may be manually moved by using the "*" or "#" keys. Maximum travel limits are automatically set up by microprocessor.
18. If any new satellites need to be programmed at a later date move the PROGRAM switch to the SET position, repeat steps 9, 10, and 11, and return PROGRAM switch to the NORMAL position.
19. If for any reason TRACKER III is slightly off on all satellites use the "*" or "#" key on any satellite to maximize signal strength and enter "01". This will resyncronize all satellites without having to reprogram all satellites.
20. If it becomes necessary to resyncronize the Tracker III Control Box with the rotor unit, select a satellite, place the set/normal switch in the set mode and maximize the signal with the "1" and "3" keys. Then enter 01 on the keypad and return the set/normal switch to the normal position. This procedure will resync both polarizations on all satellites.
21. A list of user programmable options and error codes are supplied in Table 1 below:

WIRING THE TRACKER III SENSOR

FIGURE 2 SENSOR PLUG

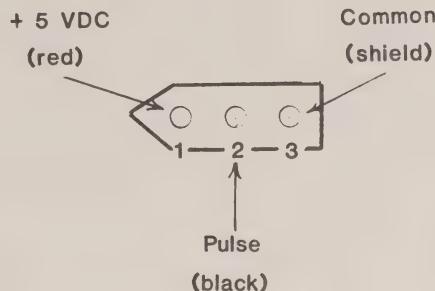


Figure 2 shows the pin connections of the sensor input plug. The pin at the point is +5VDC, the center pin is the pulse counter and the remaining pin is the common and should be connected to the shield. This connector may not be compatible with the wiring supplied by another make of satellite locator and should be changed on the hall effect sensor accordingly if applicable +5VDC red wire pulse blue wire and common black wire from hall effect sensor.

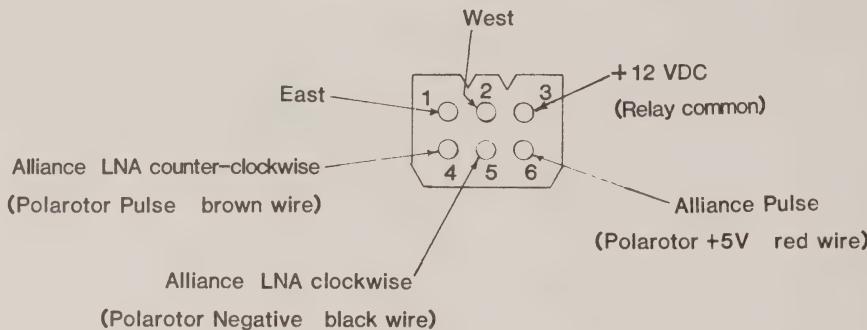
This circuit is very sensitive to any stray noise and therefore connections should only be made with shielded Belden 8451 or equivalent shielded two-conductor wire.

Make certain you do not crosswire this plug. The same wire must be at the same pin on both connectors when being wired.

If a molex tool is not available when making the installation, it is recommended that the supplied pins be soldered and bent onto with pliers. Take care not to crimp the connecting point or run solder into it.

WIRING THE TRACKER III OUTPUT

FIGURE 1 Interface / Output Plug



The Alliance antenna rotor must be used with a power interface.

The Polarotor option must be specified at the time the unit is ordered. If so equipped, the polarotor may be directly connected to the Tracker III output or interface rotor plug.

Figure 1 shows the pin connections of the output plug. One pin is + 12 VDC and should be made common to all interface relays. The remaining pins are for east, west travel, LNA clockwise, and LNA rotation pulse.

These lines are transistor switched and capable of switching only low current. Do not exceed 200 ma. This output will not drive a 12 VDC motor - it should be used to switch control relays. Most relays will operate with 22 gauge wire up to 700 feet. For greater distances, a larger gauge wire is recommended.

IF TRACKER III IS PURCHASED WITHOUT A POWER INTERFACE FIGURE 1 MAY BE FOLLOWED AS A GUIDE FOR WIRING ALL OUTPUT CONNECTIONS.

TABLE 1

ERROR CODES

E1 = Rotor Stalled (Or Improperly Connected)
E2 = Jack Stalled (Or Improperly Connected)
E3 = Satellite Not Assigned to Memory

PROGRAMMABLE OPTIONS (In Set Mode Only)

ALL OPTIONS ARE TURNED ON AT FACTORY, BUT MAY BE TURNED OFF IF DESIRED.

<u>KEYPAD ENTER</u>	<u>FUNCTION</u>
01	..... Resyncronizes Dish Motor and Rotor with Control Box
02	..... Turns Beep On
03	..... Turns Beep Off
04	..... Auto Overshoot Correction On (Recommended for Maximum Accuracy)
05	..... Auto Overshoot Correction Off
09	..... Clears All Memory

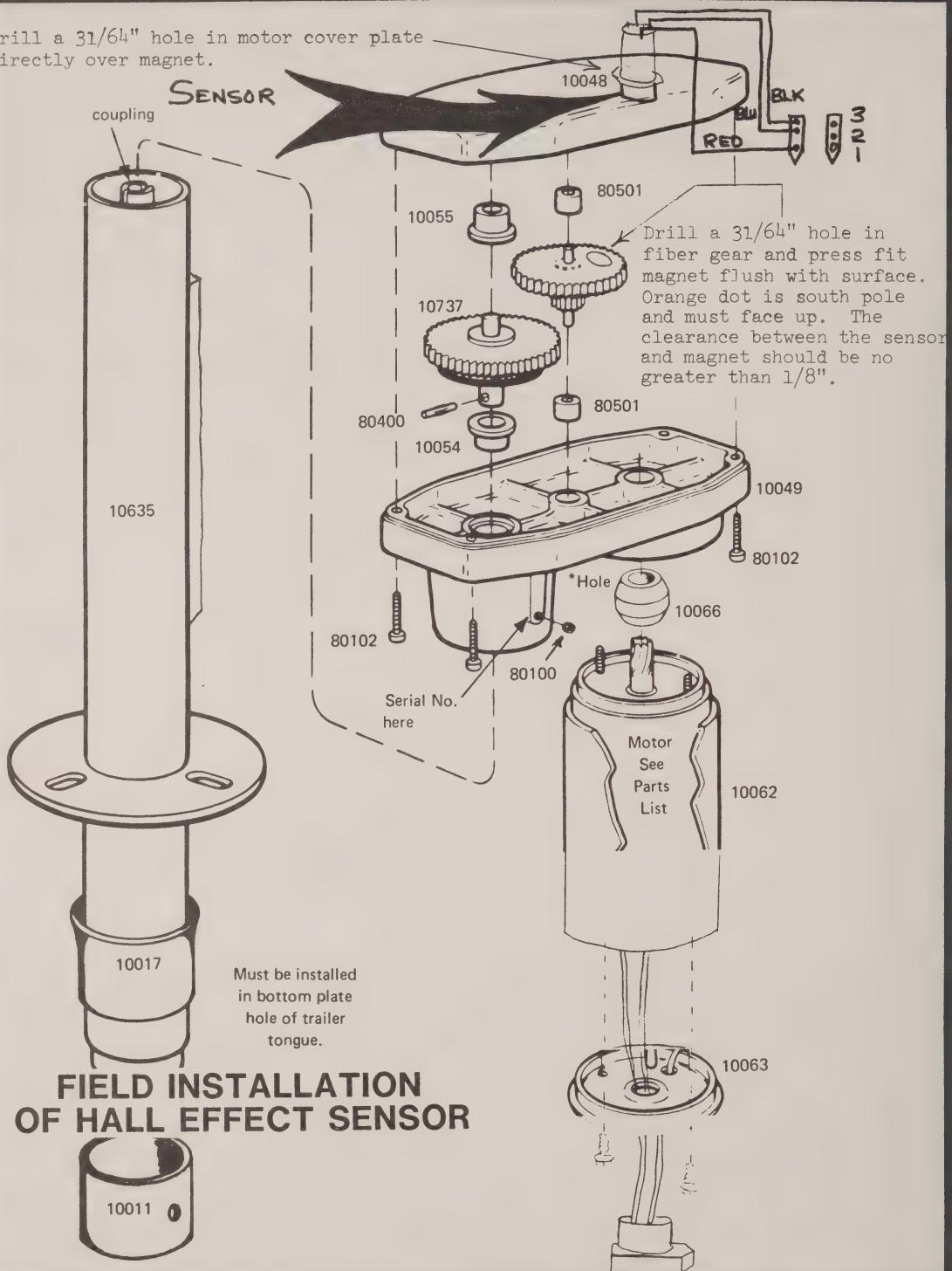
TRACKER III
POWER INTERFACE TO ACTUATOR
WIRING TABLE

FIGURE 3

600'	..... #10 gauge stranded
375'	..... #12 gauge stranded
240'	..... #14 gauge stranded
150'	..... #16 gauge stranded
90'	..... #18 gauge stranded

*SOLID WIRE MAY BE USED, BUT STRANDED IS PREFERRED

Drill a 31/64" hole in motor cover plate directly over magnet.



IN CASE OF DIFFICULTY

Upon receipt of your TRACKER III, carefully inspect it for signs of damage in transit. If any damage is noted, be sure to notify the carrier and call HOUSTON SATELLITE for a return authorization number - no returns will be accepted without the proper return authorization.

If you encounter installation problems or the unit will not operate properly, carefully read over the instructions again and be sure all connections are electrically and mechanically securely made.

If the power interface should rattle or refuse to operate as indicated by E2 error codes at the control box, open the power interface and check to be sure the relays are securely in their sockets and retained by the spring clips.

If E2 error codes still appear, check to see if the fuse is good. If it is, then proceed to see if a relay pulls in momentarily while pressing the "*" and then the "#" key. If the relays don't pull in, double check your wiring to pins 1, 2, and 3 on the 6-wire cable from the control box to the interface. If the relays do pull in momentarily, but E2 still persists, check to be sure the interface box is receiving power from the outlet it is plugged in to. Then check the wiring from the interface to the jack motor - is it electrically and mechanically secure? Is the wire of the proper gauge as selected from the wiring table?

Lastly, check to see if the jack moves briefly (approximately 1/2 second) while depressing the "*" or "#" keys. If it does, then suspect a poor electrical connection on the 2-wire shielded line between the hall effect sensor and control box.

If an E1 code is the problem, this means the rotor is defective, improperly wired, or the control box to interface is improperly wired.

Open the interface box and watch the 2 relays towards the front of the box while pressing the "1" and then the "3" key. While in the set mode, the relays will pull in momentarily. If they don't pull in, check your wiring on pins 4, 5, and 6 between the control box and interface.

If the relays do pull in, check to be sure the fuse is good and the box is plugged into an operating wall outlet. If the rotor still doesn't operate, check the connections to the molex plug on the rotor cable and the connections on the rotor.

If trouble still persists, call HOUSTON SATELLITE and consult with the Service Department. We will be glad to assist in any way we can.

(713) 784-8953

TRACKER III

P-O-L-A-R-O-T-O-R

*** ADDENDUM TO TRACKER III INSTRUCTIONS ***

The Tracker III power interface should connect to the Chaparral Polarotor as follows:

<u>Interface Rotor Plug</u>	<u>Polarotor</u>
1	(1) Brown
2	(2) Black
3	(3) Red
4	- No Connection

It is preferable to make this connection with 2-conductor shielded with the shield being connected to pin 2 on rotor plug and polarotor.

Follow instructions provided with polarotor substituting Tracker III for the controller.

Follow instructions for programming Tracker III. The "1" key will move the polarotor counter clockwise as viewed from front of dish and "3" key will move the polarotor clockwise. There will be no "E1" error codes when using the polarotor. Therefore, disregard Step 5 in programming.

OTHER SUGGESTED WIRE TO BE USED WITH TRACKER III

Control box to sensor: BELDEN 8451 or equiv. 2 conductor 22ga. shielded

Control box to Interface: WEST PENN 270 or equiv. 6 conductor 22ga.

Interface box to rotor: BELDEN 8444 or equiv. 4 conductor 22ga.

GLR-550 RECEIVER

PRODUCT DESCRIPTION

The GLR-550 is a two-piece receiver system consisting of the main receiver and a remote tuning module (TM-500). The TM-500 may be located either at the receiver, or near the dish. If the TM-500 is located outdoors, it must be installed in a weatherproof housing such as a pedestal. It should be located either behind or to one side of the dish, **NOT** at the LNA.

If the GLR-550 is used in a multiple receiver installation, an accessory FI-500 ferrite isolator must be installed at the LNA port input to the TM-500 module. This is necessary to prevent interference between different receivers.

A socket is provided on the TM-500 to plug in a relative power meter (RPM-500). The RPM-500 tracks the RF meter on the GLR-550 front panel. Range of the meters is set with the calibration knob on the front of the GLR-550. The RPM-500 is used to peak dish orientation or polarity of the feed horn. It also indicates when anything has gone wrong in the dish, LNA, or cables of the system by registering a reduced reading.

Connections are provided at the rear of the GLR-550 for an RC-500 remote control, which permits "easy chair" transponder selection.

Transponder selection is made by interlocking push buttons. The H-V select button (to the left end row of buttons) serves two purposes. The first alters the tuning voltage slightly between polarities so that the fine tuning knob remains normalized regardless of polarity. The second function provides contact closure for coaxial polarity relays or solid state polarity rotors. Connections available at the rear panel are those of a SPDT switch. Its use is limited to DC loads not to exceed 500 ma or 36 volts.

The audio system consists of two tunable audio subcarrier de-modulators and an algebraic summing section which may be switched in for matrix (L+R, L-R) stereo. Audio 1 is connected to the modulator when used.

GLR-550 RECEIVER
(cont.)

OPERATION OF AUDIO SYSTEM

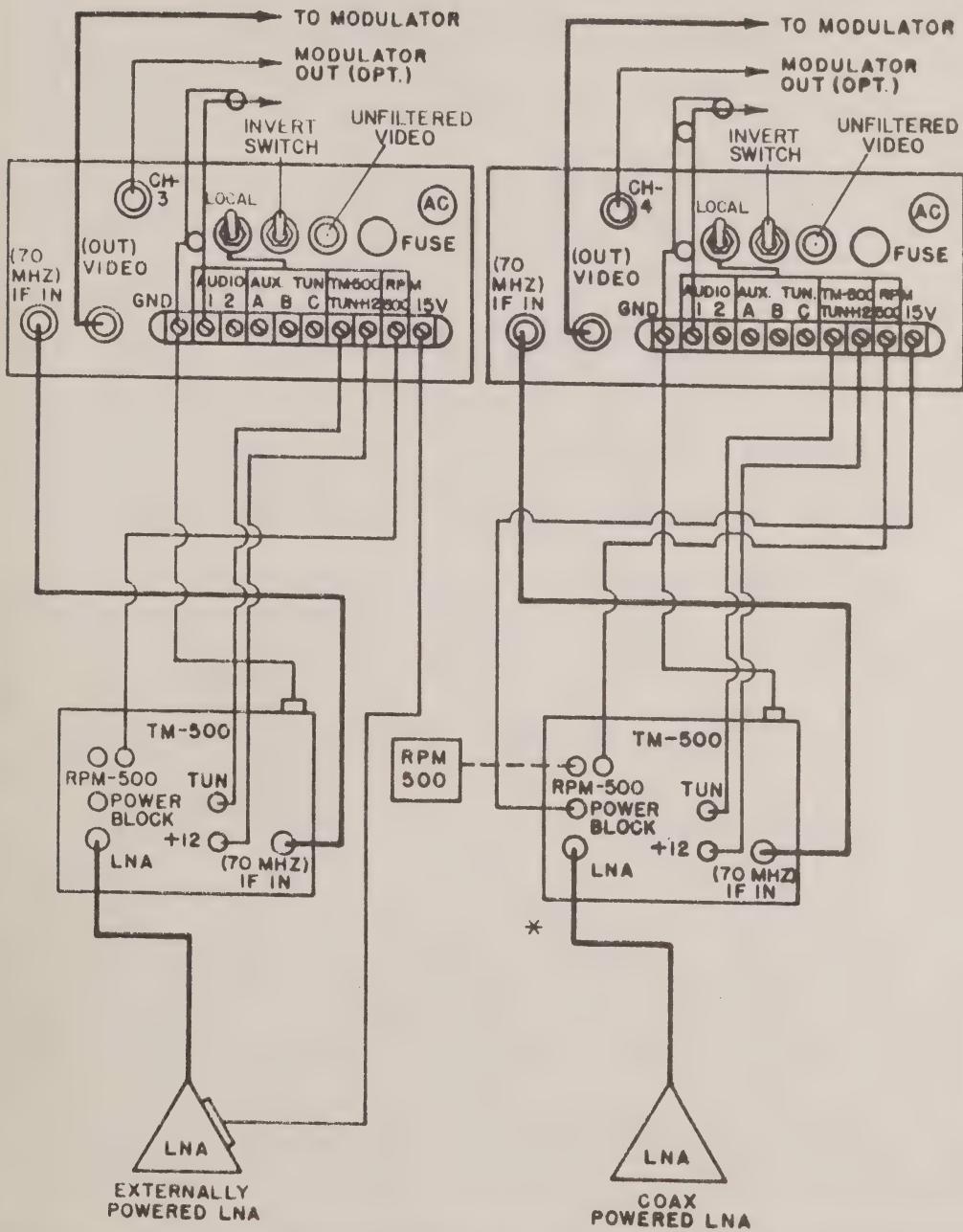
L+R and L-R Signal Processing

1. Connect the L and R outputs to a stereo amp.
2. Put Direct/Matrix button in "Direct" position.
3. Tune in main or L+R channel on both subcarrier de-modules and adjust levels for 100% on peaks.
4. Depress Direct/Matrix button. Audio 2 meter will drop and Audio 1 meter will increase.
5. Adjust Audio 2/Balance control for minimum signal on Audio 2 meter. This will tune as a null.
6. Adjust Audio 2 Tune counter clockwise to the difference channel. This is identified by audio quieting and the occurrence of stereo sound.
7. For later convenience in tuning, the knob positions, once established, may be marked.



GLR-500/550 SATELLITE RECEIVER

TYPICAL WIRING DIAGRAMS



AUTOMATION TECHNIQUES GLR-550 RECEIVER

INSTALLATION INSTRUCTIONS

Unpack the equipment and check for damage. If any is noted, promptly file a claim with the freight carrier. The carrier -- not the shipper -- is liable for loss or damage in transit.

Connect wires between the terminal strip on the rear of the GLR-550 and the corresponding solder terminals on the TM-500 tuning module. Wires must be run between the "TUN" (tuning voltage) terminals and the +12 terminals on both units. If the TM-500 is to be located at the dish, a third wire should be run between the RPM-500 terminals to permit use of the optional RPM-500 relative power meter for dish orientation. If the LNA is to be coax powered through the TM-500, run a wire from the 15V terminal on the GLR-550 to the power block terminal on the TM-500.

Run a coaxial cable such as RG-59 between the IF fittings on the receiver and TM-500. *Connect the LNA output to the TM-500 at the LNA connector. A cable with type "N" fittings is required.

As a general rule, RG-59 may be used on runs to 100 feet. For longer distances, a better grade of coax such as CAC-6 or RG-11 foam should be used.

If the LNA is to be powered from the GLR-550, run wires from the "+15" and "GND" terminals to the input connector on the LNA.

If the GLR-550 is to be used at the output of a power divider, such as is used in CATV head ends, an optional FI-500 ferrite isolator should be connected to the LNA port of the TM-500. The purpose of the isolator is to prevent the local oscillator signal from coupling back into the power divider and causing interference with operation of other receivers.

GLR-550 RECEIVER
(cont.)

OPERATION OF AUDIO SYSTEM

The GLR-550 audio system provides for reception of subscriber signals from 5 to 8 Mhz. Several operating modes are possible. They are:

Single Channel Through Modulator

1. Tune Audio 1 to desired frequency (usually 6.8).
2. Adjust Audio 1 level to 100% reading on peaks.
3. Adjust TV volume control for desired level.

Tuning Two Individual Subcarriers for
Different Signals or Discrete Stereo

1. Put Direct/Matrix button in direct position.
2. Connect Audio 1 and 2 outputs to an appropriate device such as the Aux inputs on a stereo amplifier.
3. Individually tune and set level of each audio channel for desired subcarriers.

NOTE: "Narrow band" subcarrier signals will not cause full meter deflection. Run level controls wide open. With most discrete stereo signals, the lower frequency signal of a program-pair is the left channel.

Tuning and Set-up for Matrix Stereo

First time set-up of matrix stereo may be confusing. Once understood, however, the procedure is rather straight-forward. Transmission involves two different subcarriers. The first (usually higher in frequency) is a combination or sum of the left and right audio channels. Thus, this signal (L+R) may be used as a monaural (mono) audio. When this signal is tuned in as Audio 1, the modulator receives the full audio signal. The second subcarrier contains a different signal (L-R) with the right channel subtracted from the left. Therefore, this channel will contain audio only when stereo is transmitted and the left and right channels are different.

Processing the L+R and the L-R signals to left and right channels is accomplished by appropriate circuitry when the procedure outlined on the next page is followed.

GLR-550 RECEIVER

(cont.)

HINTS AND KINKS

1. Ref: Hum bars

Horizontal disturbances floating up through the picture (hum bars) indicate the presence of a "ground loop." This is a potential difference between the dish (earth ground) and the ground at the receiver AC source connection. One, AND ONLY ONE, of the ground connections must be lifted to correct the problem. **ONE OF THE GROUNDS MUST BE MAINTAINED TO ENSURE SAFTEY!**

2. Ref: Interconnecting Cable

It has come to our attention that certain types of coaxial cable create erratic tuning conditions with the GLR-550 Satellite Receiver. These are primarily those with foil, or a combination foil/braid shield. The problem occurs when a significant resistance exists on the shield which is used as a ground path for the tuning voltage. This can be corrected by running a separate wire from "GND" on the receiver to any convenient chassis screw on the down converter (TM-500). Should you experience any drift, channel jumping, etc., you should check this possibility before returning any receivers for repair.

3. Ref: LNA Power (15V @ 200 ma.)

Some LNA's have inadequate filter capacity on their input. This can cause oscillation, herringbone and/or other picture degradation. The problem can be corrected by the addition of a 100 ufd/25V electrolytic capacitor directly on the LNA power block. The GLR-550 provides 15V @ 200 ma. (nom.) for LNA power. The built-in power block in the TM-500 tuning module incoporates the capacitor.

STRETCH

• YOUR DISH •

with the
REVOLUTIONARY

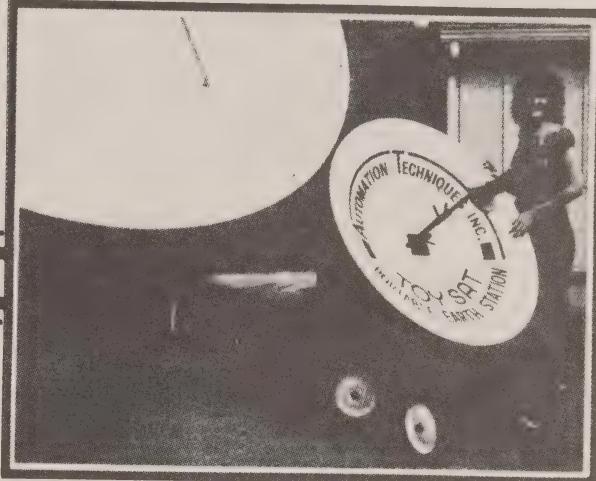
**DISH
STRETCHER**

from

AUTOMATION TECHNIQUES, INC.

We make technology affordable

The unique electronic satellite "Dish Stretcher™" is being used on TOYSAT to show how poor signal reception noise interference and "sparkles" generated from an inadequate sized dish are removed or "erased" from the picture signal.



Automation Techniques' Dish Stretcher™ introduces a simple and cost effective method to surpass the limits of previously established picture quality. Before the Dish Stretcher™ the level of sparkles or impulse noise in a received satellite picture has resulted from three characteristics of the receiving system:

1. Size and efficiency of the antenna
2. Noise figure of the LNA/receiver
3. Carrier-to-noise threshold of the receiver.

ATI's Dish Stretcher™ technology attacks the sparkles problem within a fourth area of the receiving system, the detected video signal. Sparkles generated because of a smaller dish

are identified by Dish Stretcher™ technology as improper video information, and are removed or "erased" from the picture signal after entering the receiver.

Applications for this technology include all uses of satellite television where a large dish is impractical or impossible. Clean video installations at mobile, rooftop, business buildings or congested areas can now become a reality. And it can be added to existing systems experiencing marginal performance.

Dish Stretcher™ will be available by mid-summer in stand alone or rack mount, and be priced in the \$500 range.

TOYSAT is a working portable "rig" including four-foot antenna, 100° low noise amplifier, 12 volt battery, and ATI's GLR 750 receiver.

See TOYSAT and the incredible Dish Stretcher™ at the NCTA antenna display area, and visit AUTOMATION TECHNIQUES' NCTA Booth 404.

For more information about the Dish Stretcher™ and the full line of signal and automated programming equipment call or write today!

AUTOMATION TECHNIQUES, INC.

1846 N. 106th E. Ave. • Tulsa, Okla. 74116 • 918-836-2584

APOLLO X9 ANTENNA
LNA MOUNT ASSEMBLY INSTRUCTIONS

The Apollo X9 antenna LNA mount assembly is a center-mounted prime focus apparatus with the rotor motor mounted behind the dish and the main tube cable supported for maximum stability with minimum signal attenuation. It can easily be installed by one person, but two are recommended for maximum accuracy of alignment.

Parts List

(1) Rotor bracket	(4) S-Hooks
(1) Main tube (aluminum)	(2) 3/8" X 1 1/2" bolts
(1) "Button-Hook" tube & bracket	(2) Flat washers
(1) Swivel bearing	(12) 1/4" X 1" bolts
(4) Cable plates	(8) 1/4" Hex nuts
(4) Cable assemblies	(8) 1/4" Flat washers
(4) Turnbuckles	(1) Hose clamp

NOTE: The first two steps are more easily accomplished before the dish is placed on the mount.

1. Drill a 2" hole in the center of the dish using the shallow dimpled marker as a guide. If the dimple is not plain, ensure that you have the center by measuring equally from each side. Use a two-inch hole saw and drill slowly.
2. At the center of each side of the dish, attach the cable plates as shown in Figure 1. Use 1/4" X 1" bolts, nuts and washers.
3. Attach the rotor motor to the rotor bracket using (4) hex nuts provided with the rotor.
4. Position the rotor assembly so that the end of the motor with the blue plastic cap is exactly centered in the 2" hole in the dish. Mark and drill the 3/8" holes at each end of the rotor assembly angle in the dish mounting hub. Attach the assembly to the dish using 3/8" X 1 1/2" bolts, nuts and washers. See Fig. 2 for details.
5. With the split end out, insert the main tube into the rotor motor from the dish face side until it just clears the bottom end. Secure the tube with U-clamps which are provided with the rotor.
6. Slip the hose clamp onto the main tube. Hook the S-hooks into the cable plates, one end of the cables into the S-hooks, and the turnbuckles into the opposite end of the cables. Make sure the turnbuckles are fully extended (screwed out).

APOLLO X9 ANTENNA
LNA MOUNT ASSEMBLY INSTRUCTIONS

Continued:

7. Slide the swivel bearing on the button-hook tube and slide the button-hook tube onto the main tube. Support the assembly with one hand and hook each turnbuckle into the rings on the swivel bearing.
8. Gradually tighten the turnbuckles until all the slack is out of the cables. Ensure that the tube remains centered by taking numerous measurements while tightening the turnbuckles. The distance must be the same from the bearing to each cable plate. Do not overtighten the turnbuckles as they may distort the dish.
9. Attach the LNA feedhorn as shown in Figure 3.
10. After making polarization and focal distance adjustments, secure the button-hook tube within the main tube by tightening the hose clamp on the split end of the main tube.
11. Apply a liberal amount of water-resistant grease to the swivel bearing.
12. Figure 4 shows the completed installation.

YOUR NOTES:

APOLLO SQUARE MOUNT
ASSEMBLY INSTRUCTIONS

Parts List:

(2) 2 1/2" Base Angles
(1) Tall upright
(1) Short upright
(1) 3" square tube polar axis assembly
(1) Positioning jack (has bracket farthest from handle)
(1) Inclination jack (has bracket closest to handle)
(1) Dish frame
(26) 1/2" X 1 1/4" bolts
(2) 1/2" X 4 1/2" bolts
(18) 1/2" lock washers
(8) 1/2" flat washers
(28) 1/2" hex nuts

1. Place the two long pieces of 2 1/2" X 2 1/2" angles parallel to each other and about 31" apart with the flanges up and out.
2. Bolt the two uprights between the angles using 1/2" X 1 1/4" bolts, lock washers and nuts, with the bracket on the tall upright facing in.
3. Bolt the 3" X 3" square polar axis tube to both uprights using 1/2" X 4 1/2" bolts, lock washers and nuts, with the end with the plate with two holes toward the tall upright and the bracket midway on the tube, facing down.
4. Select the inclination jack (the one with the bracket with the square corners on the end) and attach it to the axis tube and upright, using 1/2" X 1 1/4" bolts, lock washers and nuts.
5. Attach the dish mounting frame to the mounting plates on the axis tube using 1/2" X 1 1/4" bolts, lock washers and nuts, with the longer mounting plates on the frame toward the tall upright.
6. Attach the positioning jack to the dish frame and axis tube using 1/2" X 1 1/4" bolts, lock washers and nuts. Facing the mount from the handle-end of the lower jack, attach the upper jack between the right side bracket on the dish frame and the right hole on the axis tube if you live in the Eastern part of the country, or the left bracket and left hole if you live in the western part of the country.

APOLLO SQUARE MOUNT
ASSEMBLY INSTRUCTIONS

Continued:

7. The X9 antenna is attached to the dish frame using 1/2" X 1 1/4" bolts, lock washers and nuts. Place the dish on the dish frame and align the corners of the dish with the corner of the frame. Center the dish on the frame and drill through the two holes in the brackets at each corner of the frame. Use caution, and drill only through the mounting hub on the dish.
 8. The antennas using a flange mounting arrangement are attached to the frame using adapting T-brackets bolted to the corner brackets of the dish frame. The dish is centered on the frame with the adapting brackets against the quadrant mating flanges. Drill through the flanges and attach the dish using 1/2" X 1 1/4" bolts, lock washers and nuts.
 9. Install the LNA mount assembly according to its instructions and align the antenna according to the alignment instructions.
-

YOUR NOTES:

APOLLO X-10 ANTENNA
DISH AND LNA MOUNT ASSEMBLY INSTRUCTIONS

PARTS LIST:

- (8) DISH PANELS
- (1) ROTOR BRACKET
- (1) CENTER SUPPORT TUBE
- (1) "BUTTON-HOOK" TUBE AND BRACKET
- (1) ALUMINUM FRONT PLATE
- (8) SPLICE PLATES
- (11) 1/2" X 1 1/4" BOLTS
- (1) 1/2" X 2 1/2" BOLT
- (4) 1/4" X 1" BOLTS
- (13) 1/2" HEX NUTS
- (12) 1/2" LOCK WASHERS
- (72) 3/8" X 1" BOLTS
- (72) 3/8" LOCK WASHERS
- (72) 3/8" HEX NUTS
- (132) 3/8" FLAT WASHERS

DISH ASSEMBLY:

Prepare an assembly area on a uniform level surface by placing cardboard or other cushioning material on the surface to prevent marring the dish.

1.) Assemble two halves of the dish separately, face down. Use 3/8" X 1" bolts with a flat washer under the head and another along with a lock washer under the nut to bolt the flanges together. For optimum performance of the dish, insure that the edges of the panels on the face of the dish are flush with one another while tightening the bolts. Do not overtighten the bolts to the point that the flanges begin to crush. Install the splice plates at each panel junction using the set of (4) holes closest to the dish rim. See Figure 1.

2.) Place the two halves together, still face down, and bolt them together from the outside-in, on both sides. Be extremely careful not to place excessive weight on the dish during this phase of assembly.

3.) The dish may now be placed on the mount. Follow the instructions for the particular mount being used. Finish securing the dish before installing the feed.

LNA MOUNT (FEED) ASSEMBLY INSTRUCTIONS:

The Apollo X-10 feed assembly is a center mounted system with the rotor motor mounted behind the dish, allowing maximum positioning accuracy with minimum attenuation. It can easily be installed by one person, but two are recommended for maximum accuracy of alignment.

1.) Place the center support tube assembly onto the back of the dish with the tube protruding through the hole in the center of the dish and the cross centered on the flanges. Splice the aluminum faceplate over the tube from the front of the dish and secure it to the center support tube assembly cross using (3) 1/2" X 1 1/4" bolts and (1) 1/2" X 2 1/2" bolt with nuts and lock washers. Tighten the bolts until the plate just starts to dimple.

2.) Attach the rotor motor to the rotor bracket using (4) hex nuts provided with the rotor. The motor is installed with the blue-capped end toward the end of the bracket with the 1/2" hole.

3.) Place the rotor bracket onto the long bolt sticking out of the cross. Secure the assembly loosely with a 1/2" nut. Position the rotos assembly so that the end of the motor with the blue plastic cap is centered in the dish. See Figure 2.

4.) Attach the LNA or LNC and feedhorn to the button-hook tube as shown in Figure 3 using (4) 1/4" X 1" bolts.

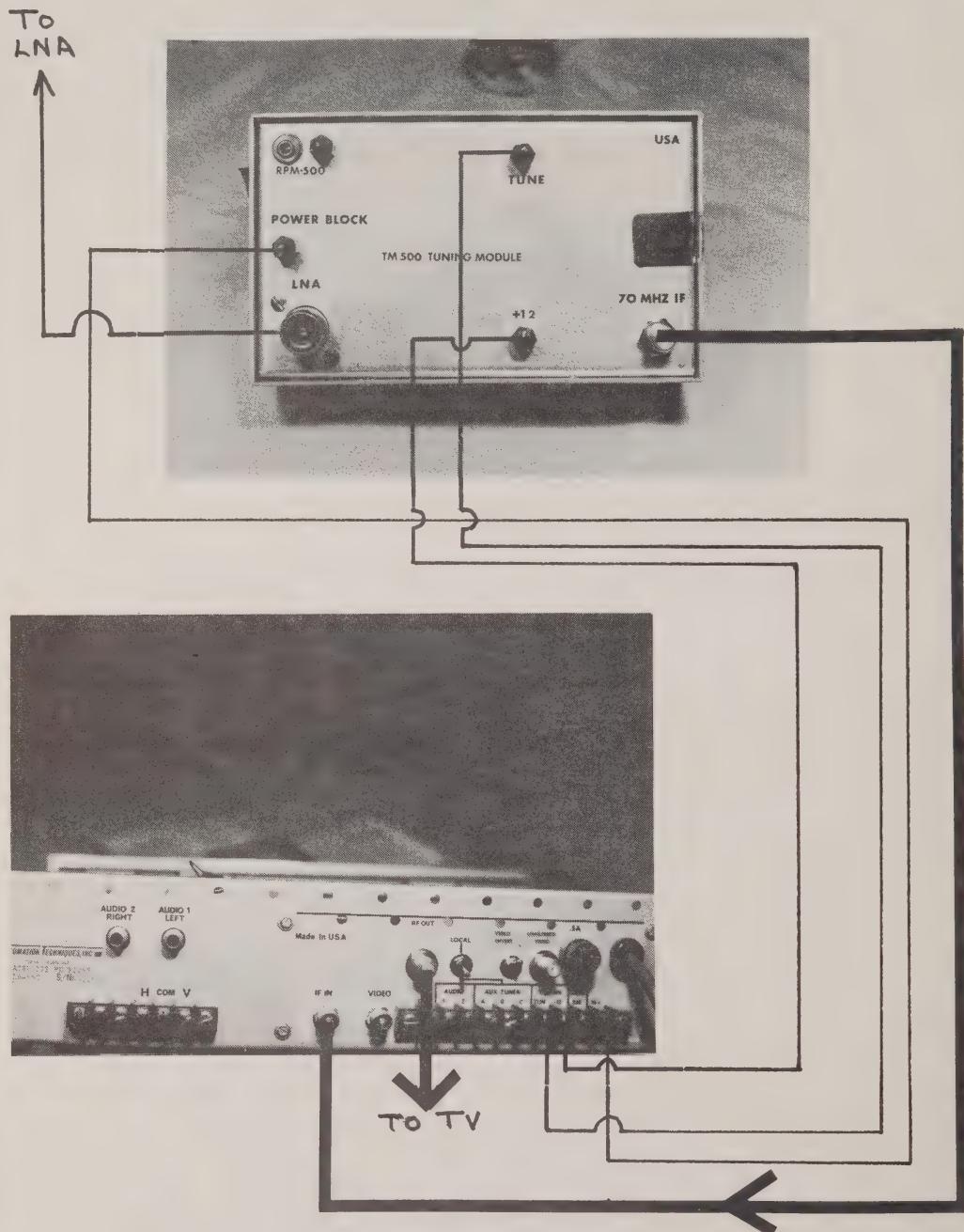
5.) Apply a liberal amount of water-resistant grease to the lower 15" of the button-hook tube. Slide the button-hook tube into the center support tube and on into the rotor motor from the dish face side until it just clears the bottom end. Secure the tube with the U-clamps provided with the rotor.

6.) The LNA or LNC cable may be run through the tube for protection and aesthetics.

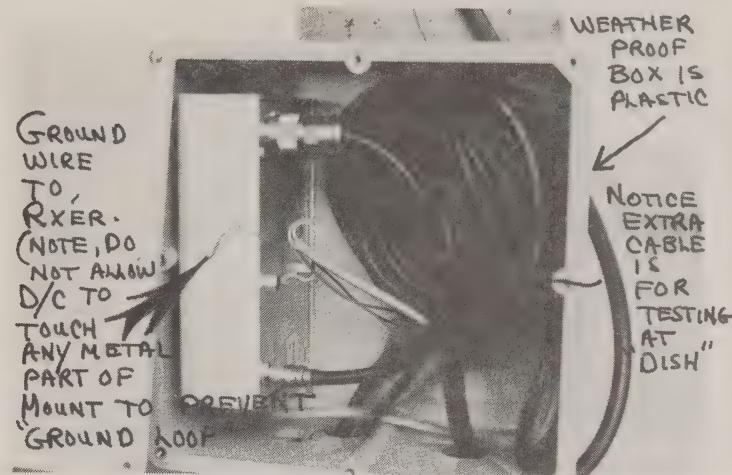
7.) After making polarization and focal distance (36 1/8" from face of dish to end of feed horn) adjustments, secure the button-hook tube by tightening the clamps on the rotor motor. Place a second nut on the bolt holding the rotor bracket and "lock" it to the first one by tightening them against each other. This will allow the rotor to "float," lessening the chance of a restriction of free rotation.

8.) Figure 4 shows the completed installation.

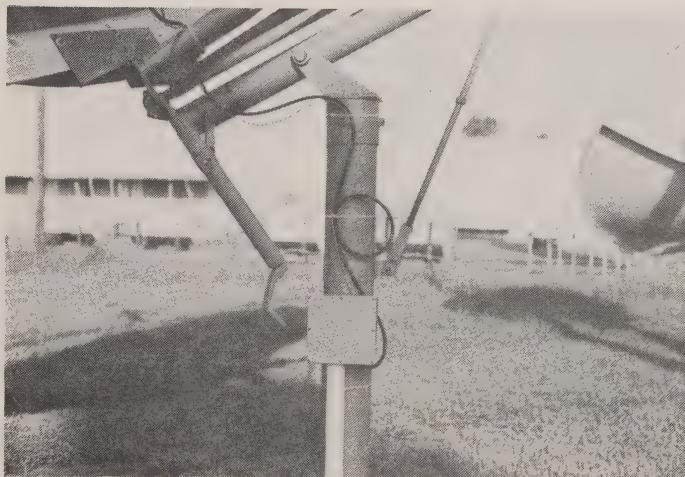
AUTOMATION TECHNIQUES GLR-550 DOWNCONVERTER AND RECEIVER HOOKUP



LOCATING THE DOWN CONVERTER

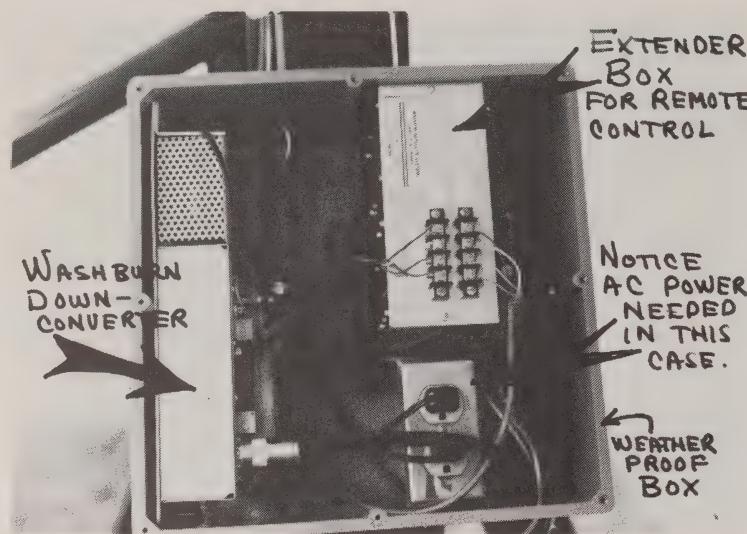


Locating down converter in weatherproof box.

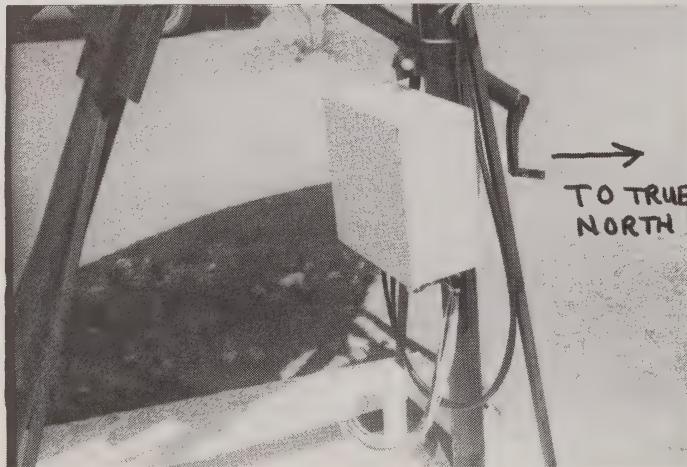


Weatherproof box located on unipole type mount. Weatherproof box cuts down on maintenance and tampering by children.

Locating Downconverters continued

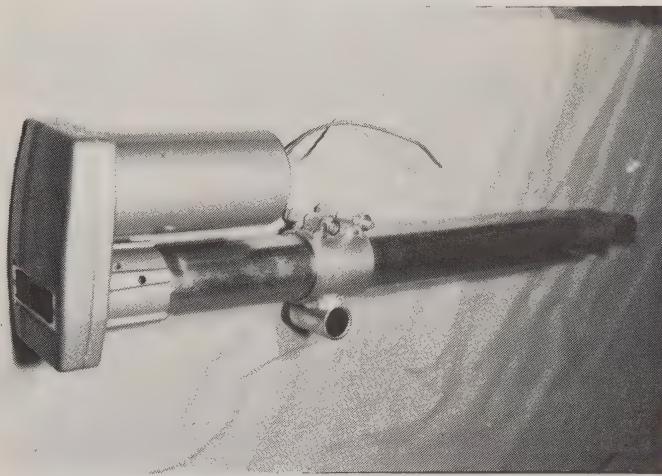


WASHBURN DOWNCONVERTER



Downconverters located on an Apollo X10 mount.

MAKE YOUR OWN DISH MOVER



MAKE YOUR OWN DISH MOVER

By being mechanically inclined you can make your own Satellite Mover by simply removing the azimuth jack and buying a remote jack. * Weld the bracket that you need to match your old jack; hook up the wires to your power supply control box and your dish will move back and forth if you have a polar mount. True, it is not as good as an automatic system but it will keep you from having to go out in the rain to move your dish.

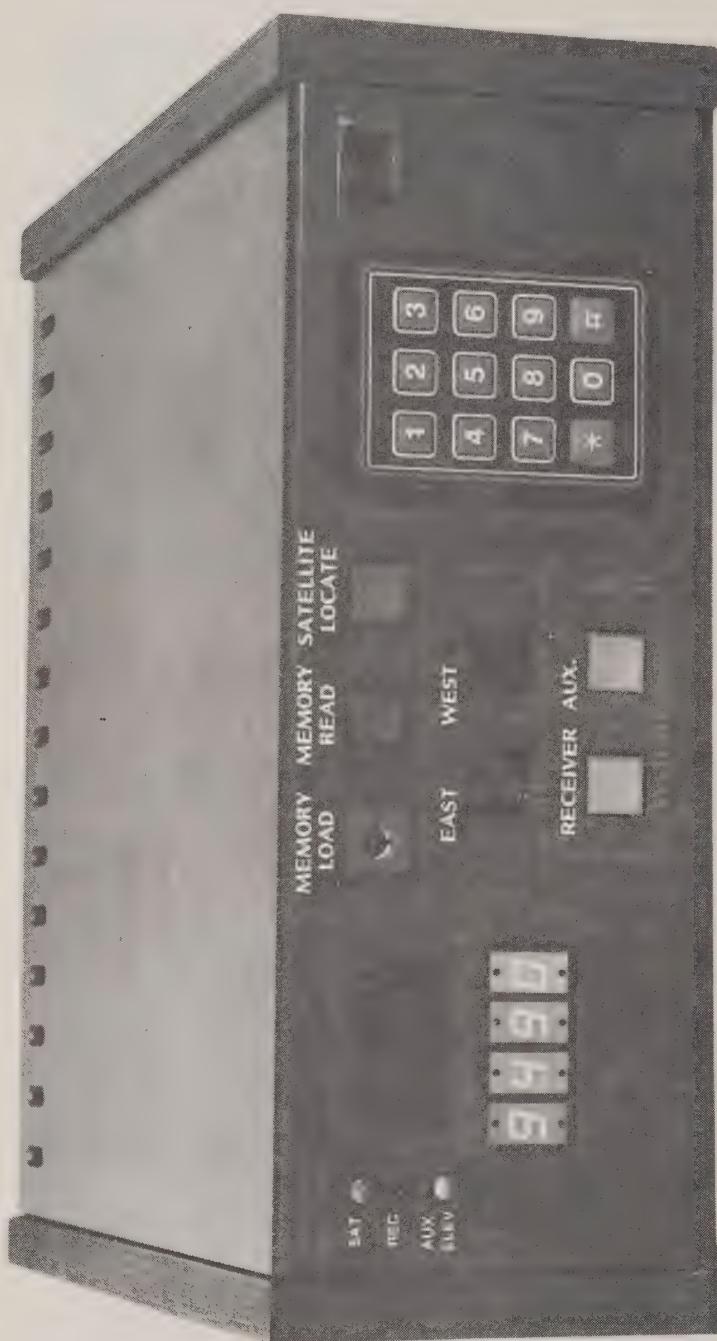
TECH NOTE:

Be sure to measure the travel of your old jack and request a 36 volt type motor and control box.

* The remote jack can be purchased from:

Burr Engineering
730 East Michigan Ave.
P.O. Box 460
Battle Creek, Mich. 49017
Tel: 616-965-2371

VECTOR REMOTE SATELLITE FINDER



VECTOR SYSTEMS

INITIAL CONNECTION

1. Connect the Hall Effect Sensor to the azimuth sensor plug by following the schematic shown in Figure A. The shield is optional but would provide extra protection from electrical storms if used.
2. Connect the motor to the relay card following the schematic shown in Figure B. The terminals are numbered on the foil side of the circuit board.
3. After connecting the motor, check all connections carefully. Test the motor circuit by pressing the east and west switch on the front panel. If the antenna position read-out equals zero, the inhibit release switch on the rear panel will need to be pressed to get the indicator to count downward.
4. If the motor operates but the counting is uneven or non-existent, check for sensor alignment or connection mistakes.
5. The actuator motor should be connected to cause the actuator piston to pull inward while down-counting and the piston to extend when the count moves upward. If necessary, reverse the motor leads to achieve this action.

COUNT CALIBRATION:

1. After completing the motor and sensor connections, operate the manual East-West switches and bring the actuator piston inward to full retraction. At this point, press the reset switch on the rear panel to zero the actuator counter. Then extend the piston to a count of 25. At this point, re-zero the count by pressing the reset switch again. This establishes the **home** reference point of the counter.

SATELLITE POSITION RECORDING:

1. Operate the East-West manual switches to locate the desired satellites.
2. Assign a number to their location with the keyboard and press the Memory switch on the front panel to store the Antenna position into the Load Memory.
3. The memories can be assigned to any satellite in any order. Also, more than one memory can be used for

VECTOR SYSTEMS
Page 2

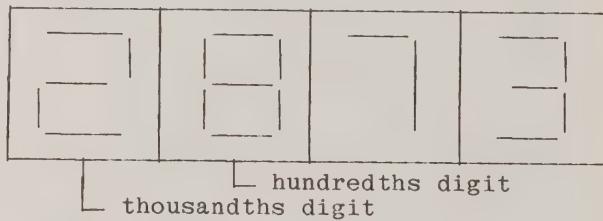
the same satellite.

4. To automatically reach any stored satellite position select the desired satellite on the keyboard and press the "satellite locate" switch.

UPPER LIMIT STOP ADJUSTMENT

To help prevent operation of the motor drive system beyond its normal safe operating range, a travel limit circuit can be adjusted to stop the dish movement at a pre-selected point. This adjustment is based on presetting the hundredths and thousandths digit to a preset value. When the count reaches this number, the movement will stop either in the manual or automatic mode.

COUNTER
DISPLAY -



As an example, if the last satellite is at a count of 2873, the upper limit number would need to be 2900. The 2 and 9 would be preset into the upper limit circuit. If the last reachable satellite was at 0836, the upper limit would be 0900.

To set the upper limit, remove the top of the unit by removing the two screws in the rear of the cabinet and the two screws below the front panel. Near the rear of the main circuit board, an 8 position dip switch is adjusted to preset the two digits. The Upper Limit Switch Position Chart [Next page] gives the proper combination of switches to preset.

VECTOR SYSTEMS

Page 3

UPPER LIMIT SWITCH POSITION CHART

THOUSANDTHS								HUNDREDTHS				Switch Number
	1	2	3	4		5	6	7	8			
0	off	off	off	off	0	off	off	off	off			
1	off	off	off	on	1	off	off	off	on			
2	off	off	on	off	2	off	off	on	off			
3	off	off	on	on	3	off	off	on	on			
4	off	on	off	off	4	off	on	on	off			
5	off	on	off	on	5	off	on	off	on			
6	off	on	on	off	6	off	on	off	off			
7	off	on	on	on	7	off	on	on	on			
8	on	off	off	off	8	on	off	off	off			
9	on	off	off	on	9	on	off	off	on			

EXAMPLE:

To stop on the number 2500:

	1	2	3	4		5	6	7	8
2	off	off	on	off	5	off	on	off	on

To stop on the number 1800:

	1	2	3	4		5	6	7	8
1	off	off	off	on	8	on	off	off	off

When this upper limit is reached using the manual East and West switches, the motor will automatically stop. To release the limit, simply operate the dish in the reverse direction. When the limit is reached in the automatic mode, the dish is stopped at the limit. To re-start the automatic locate, the motor must be manually operated below the limit number.

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Page 4

PRECAUTIONS ABOUT THE VECTOR 100

UNUSED MEMORIES

The 100 memories contained in the Vector 100 can be programmed with any satellite position number desired. However, memory locations that have not been programmed may contain random numbers which were generated by initial power-up. If a mistake is made in selecting the desired satellite, (i.e., requesting satellite 77 in place of 7), the dish will seek the undesired number contained in the memory location. **We suggest** you load the unused memories with the number for the satellite most often received to help prevent undesired dish movements.

REFERENCE POINT FOR ZERO COUNTER RESET

The normal procedure for establishing the counting point reference calls for running the antenna motor in the down-count direction until it reaches its mechanical limit where the count is then zeroed, using the reset button located on the rear of the unit. Then the motor is moved up to a count of 25 or 50 and reset to zero again. This is your reference point for all future satellite numbers. However, this may not be a practical method if the motor cannot be easily operated to its mechanical limit. If this is a problem, you may use the last satellite in the down-count direction as a zero reference. We suggest you accurately find this satellite and then count 25 or 50 counts below its position and use that as zero, since making the satellite position zero would cause the unit to not take a search command, when it reaches zero (0). (See: UPPER AND LOWER LIMIT INHIBIT, which follows). Using this method may not be as accurate as using the actuator mechanical limit method, since the reference satellite position can cover a number of counts.

VECTOR SYSTEMS

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BATTERY BACKUP SUPPLY

As with almost all digital equipment, voltage must be maintained on the circuitry to prevent the digital memory from being erased. For this reason, the AC power to the unit must be maintained at all times during normal operation. However, two AAA batteries may be installed in the rear of the unit to maintain the circuit voltages during power outages. These batteries will maintain the memory for about a week of continuous use. If alkaline batteries are used, the batteries should remain good for approximately 2 years with short one and two hour power outages occurring intermittently.

IMPORTANT: When removing the unit from service for a period of time, remove the batteries since they will be discharged without AC power in the unit. The keyboard (*) switch will remove power from the displays and inhibit the front panel switches but power will remain on the internal circuits.

AC POWER GROUND

To help protect the internal circuitry from lightning storms and reduce static electricity disturbance of digital information, mount the third pin of the AC cord to a convenient ground or use a grounded 3-circuit receptacle.

UPPER AND LOWER LIMIT INHIBIT

During the regular operation of the Vector 100, mount movement is confined to the preselected region of travel between the upper limit preset at installation and the number zero. If either limit is reached by manual or automatic control, the dish will stop and not move until an opposite direction command is given. The satellite LOCATE switch is also inhibited and will not go to another position until the limit is released.

VECTOR SYSTEMS

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MOTORS WITH SLIP CLUTCHES

Many of the popular screw jack actuators have a slip clutch which prevents the motor from stalling if its upper and lower mechanical limit is reached. If these points are reached while using the Vector 100, it will be necessary to re-establish the reference point for the count, since the slippage involved will change the count reference. These actuators are designed to only slip when the piston is not allowed to move; therefore, any slippage found within the actuator's normal travel would indicate mount problems that need correcting. By placing the upper and lower limits between the mechanical limits of the actuator, no slippage should occur during normal operation.

COUNT INHIBIT

To prevent electrical noise (lightning, or strong CB transmissions) from possibly creating undesirable count pulses, the unit will not accept pulses for count unless the manual East & West switches are pressed. If the motor is operated by a control **other than that provided by Vector 100**, the unit will not count, thereby retaining its reference.

YOUR PERSONAL NOTES:

VIDTECH COMMUNICATIONS HYDRAULIC ANTENNA ACTUATOR

Vidtech Communications' Hydraulic Antenna Actuator was designed from the ground up by Hydraulics Engineers for use with satellite antenna systems. Its unique design provides very smooth operation and it can be easily adapted to any polar mounted antenna.

The solenoid-operated control valve borrows technology from marine steering systems which, of necessity, are highly reliable and require minimal attention. When the valve is at rest, the hydraulic circuit is locked so the cylinder cannot be moved by antenna wind loading. The valve can be operated at the antenna by a manual over-ride which allows one-man installation and easy alignment. The flow control option provides variable speed adjustment in one of both directions.

The remote control unit uses high quality, spring-loaded toggle switches which allow antenna adjustments in increments as small as 1/32". The position indicator is driven by a slide tube assembly, NOT by the cylinder rod. It is independently powered by two 9-volt alkaline batteries, thus avoiding reading fluctuations caused by motor operation. Battery life is approximately one year.

This is a component system; all parts are readily available and easily replaced. Each unit is provided with a comprehensive owner's manual which outlines installation and maintenance procedures. DC models require a 12-volt battery (not included). Both units are warrantied for one year.

See next page for full list of specifications.

VIDTECH COMMUNICATIONS
HYDRAULIC ANTENNA ACTUATOR

(cont.)

SPECIFICATIONS:

DC motor: 12 VDC, permanent magnet type with built-in solenoid.

AC motor: Single phase, 1/2 hp, 115 VAC (230 VAC available upon request).

Cylinder: Double acting, 2" bore, 44" stroke; operates at maximum 3,000 psi with 3:1 safety factor.

Hoses: 1/4", non-conductive type, rated at 2750 psi.

Pump: 1500 psi capacity with built-in adjustable relief valve.

Control Valve: Solenoid operated with local manual over-ride. High reliability; meets marine standards for steering systems.

Fluid: Type F, automatic transmission fluid.

Fluid Capacity: Approximately 5 quarts.

Travel speed: Full extension in 24 seconds. Full retraction in 17 seconds.

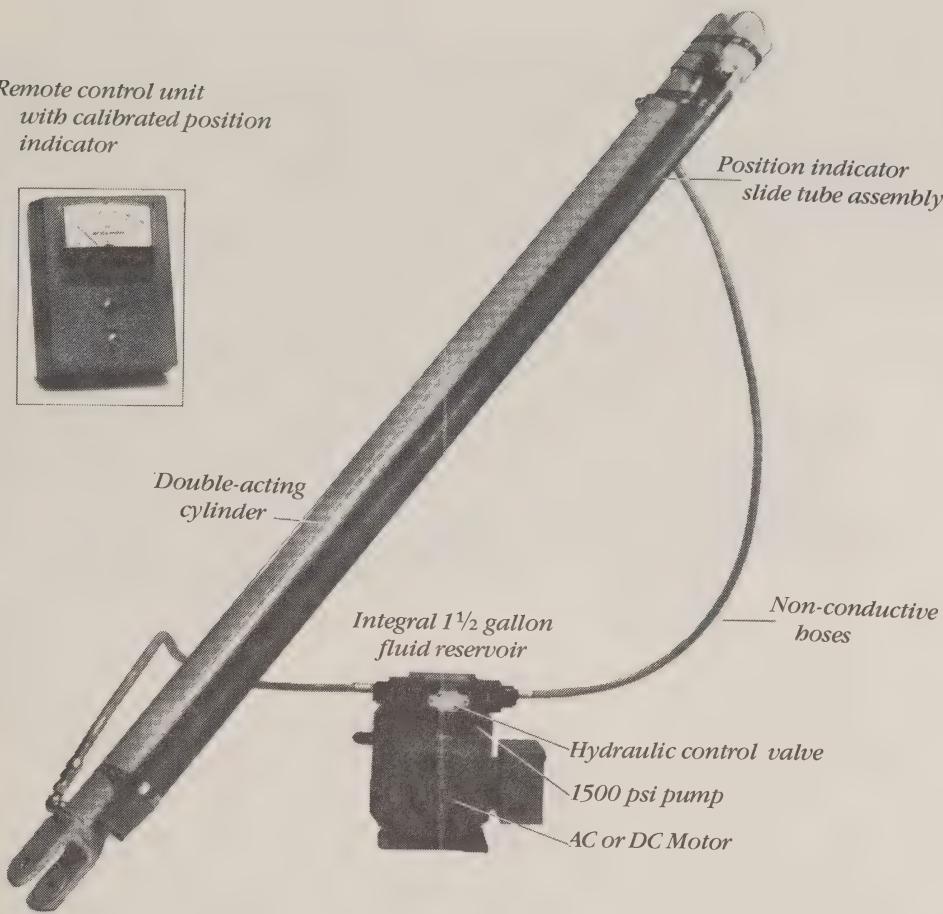
Fine adjustment: Calibrated to 1/32" travel.

Control wiring: Alpha, part # 1898/6, 18 ga., six conductor multi.

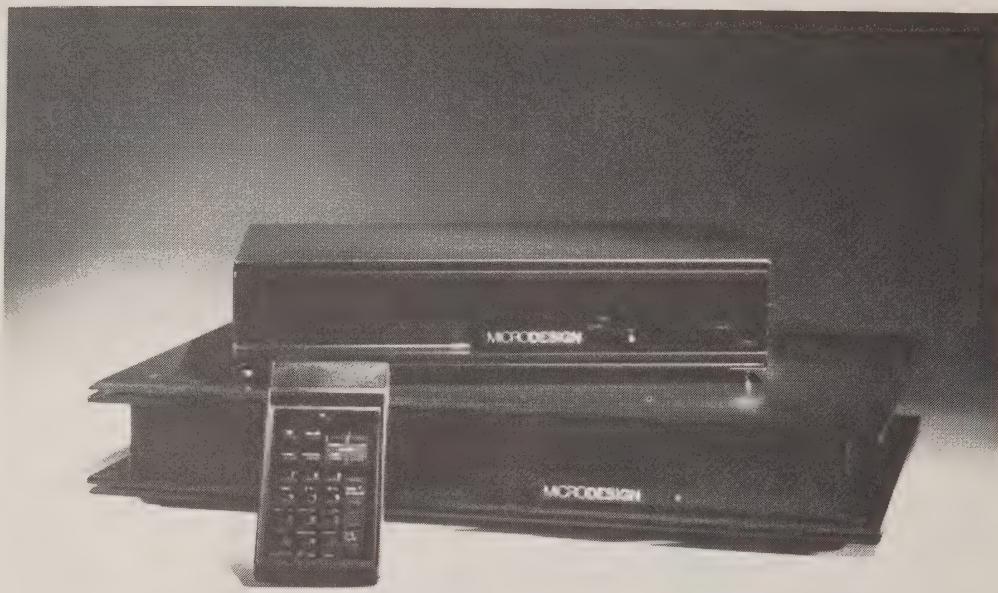
AC wiring: Ampacity table included in owner's manual.

Clevis: 1 1/8" width, 1/2" pins.

*Remote control unit
with calibrated position
indicator*



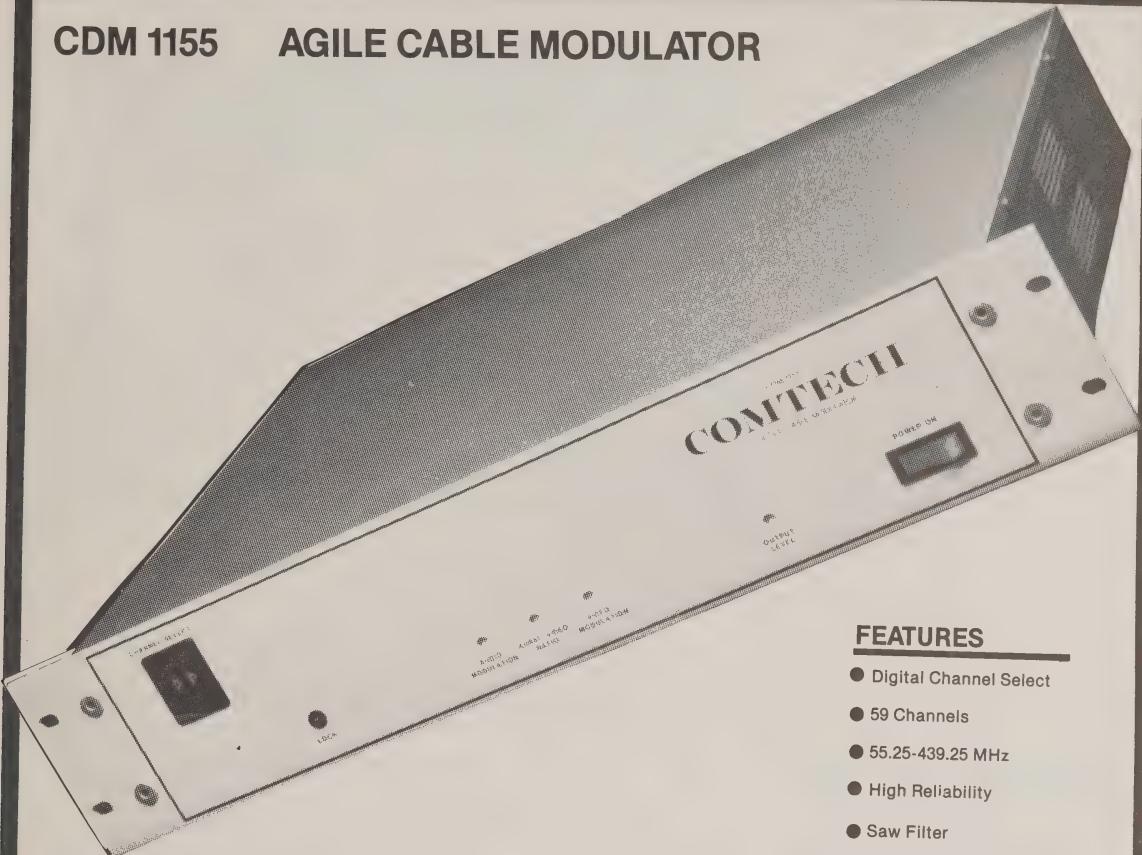
MICRO DESIGN ...
AN ADVANCED RECEIVER



With this receiver, available from most National Microtech Dealers, the viewer is able to receive signals from the geostationary satellites in the 4 Ghz. Band. The receiver contains a micro computer that responds to all commands from a wireless remote control. This control even controls moving the dish from satellite to satellite. (Note from author: While installing this system I was adjusting the dish when the receiver started flashing "HELP". I had over rotated the "dish". Smart receiver is an understatement!



CDM 1155 AGILE CABLE MODULATOR



FEATURES

- Digital Channel Select
- 59 Channels
- 55.25-439.25 MHz
- High Reliability
- Saw Filter
- Low Cost
- Low Power Consumption

DESCRIPTION

The CDM 1155 is a low cost alternative for CATV headend operation. Ideal as either a primary or backup channel modulator. Merely change front panel digital switch for quick and accurate selection of any of the standard channels from 55.25 to 439.25 MHz. Optional programming of the channel select switches to customer requirements available. Convenient expansion for additional channels.

Excellent stability and performance are achieved through the use of a SAW filter and a phase locked channel synthesizer locked to a 45.75 MHz crystal reference.

Comtech Data Corporation also supplies complete systems for the sophisticated user.

SPECIFICATIONS

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE



COMTECH
Data Corporation
A SUBSIDIARY OF COMTECH TELECOMMUNICATIONS CORP.

ATTENTION! CATV OPERATORS AND TVRO DEALERS AMERICA'S FINEST TVRO VALUES

The LOCUS series
of uncoded
Ultra-low Noise
Amplifiers come
in noise figures
from 70K to
110K

LOCUS

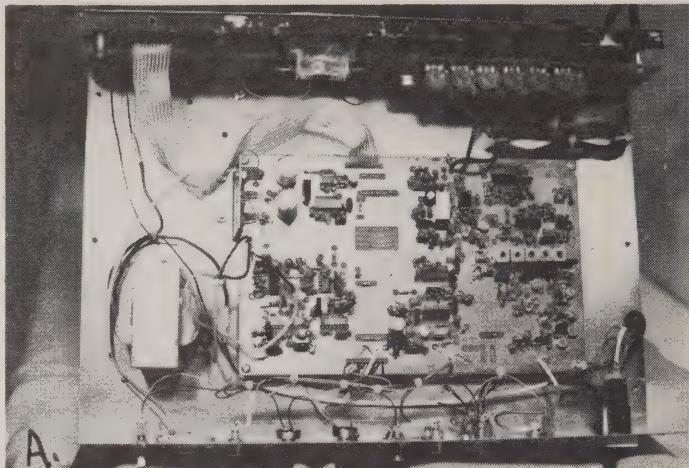
The amplifiers have full built-in protection against voltage transients and line surges, and are designed to operate in a high density environment, with excellent shielding against interference. Mean Time Between Failures (MTBF) is in excess of 75,000 hours.

The Locus LNA is used by COMSAT General in the intelsat Earth Station network throughout the world. Our large volume purchases enable us to bring you these LNA's at hundreds even thousands of dollars less than you would expect to pay.

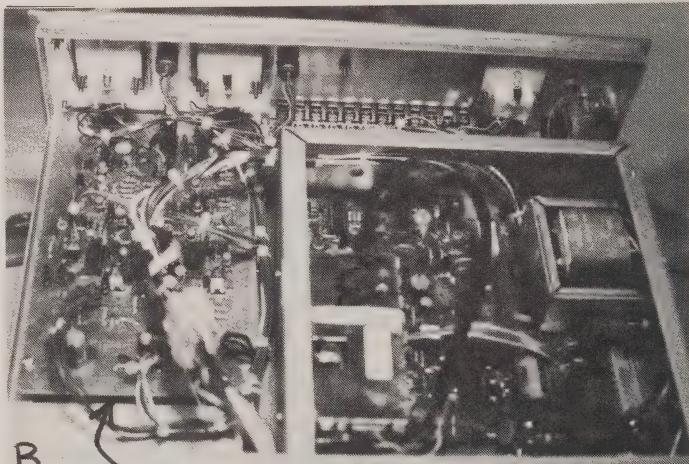
The Agile 24M/S series is a highly cost-effective, reliable satellite receiver master-slave system which offer true professional broadcast studio performance. The Agile 24M is a 24-channel, stand-alone master receiver with sufficient gain to drive as many Agile 24S slave receivers as required to satisfy any satellite communications system. The 24S unit is a complete 24-channel receiver except for the first block down converter. Through use of a loop-through design, no passive power dividers are required to drive up to 100 Agile 24S units from a single Agile 24M.

**AMERICAN
MICROWAVE
TECHNOLOGY**

P.O. Box 824
Fairfield, Iowa 52556
(515) 472-3174 TWX 910-520-2754

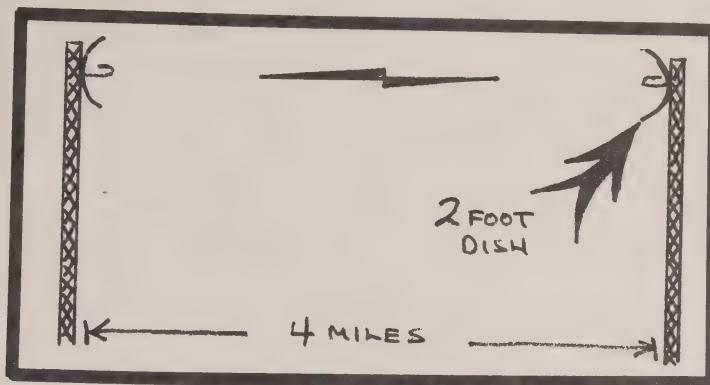


Some receivers may have less inside "guts" than others. Below is the Automation Techniques 550 receiver. Notice the large audio board. The Automation Techniques have a unique audio filter unlike any other receivers.



STEREO AUDIO BOARD

LONG DISTANCE VIDEO FOR HAM OPERATORS ONLY

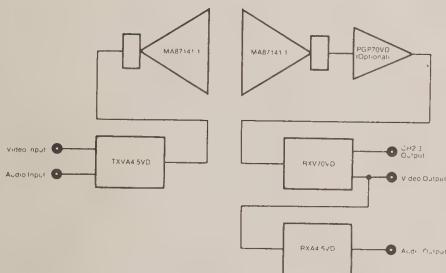


Typical point to point video link.

System recommendations

Distance System

1/4 mile	17 dB horn to 17 dB horn
1/2 mile	17 dB horn to 17 dB horn plus PGP70VD
1 mile	17 dB horn to 2' dish plus PGP70VD
1 mile	2' dish to 2' dish
2 miles	2' dish to 2' dish
4 miles	2' dish to 2' dish
8 miles	2' dish to 2' dish plus PGP70VD
16 miles	2' dish to 2' dish plus PGP70VD



Typical Gunnplexer Video System (One Way)

"Hams" have always been innovative and resourceful. If you are an amateur you might want to contact:

Advanced Receiver Research

P.O. Box 1242

Burlington, Ct. 06013

Phone No. 203-582-9409

Their catalog is very interesting.



COMTECH Satellite Video Receivers Set the Industry Standards!



Here's Why:

- 24 channel LED readout with broadcast quality, drift-free reception • 6.2/6.8 MHz program demods
- Dual conversion (Model 550) • Frequency synthesized
- Remote control capability • Self-contained LNA power supply • Available in standard or rack mount configurations.

Trouble-free operation and the last word in dependability are yours with a Comtech Video Receiver. These uncompromising standards have earned the respect of users nationwide and a dedicated dealership organization of recognized professionals in the field of Satellite Communications. The below listing of Comtech Dealers are ready to answer any questions you may have regarding a Comtech unit or you can call Jeannine Hillier factory direct at (602) 949-1155

H & R SATELLITE
POCAHONTAS, AR
1-800-643-0102
JOHN HASTINGS

CHANNEL 1 VIDEO
VANCOUVER, BC, CANADA
(604) 734-4966
TOM HOLGATE

KITTELVISION
SEBASTOPOL, CA
(707) 829-2362
MIKE KITTEL

AEROWAVE CO.
AURORA, CO
(303) 363-9024
STEVE ADLER

ACTIVE SAT.
NISSWA, MN
1-800-346-3801
STUART SMITH

EARTHVIEW SYSTEMS
NEWBURG, MO
(314) 762-3636
JOHN HART

JDF COMMUNICATIONS
MINOA, NY
(315) 656-9032
JOHN FANNETTI

MAIN ELECTRONICS
REYNOLDSBURG, OH
(614) 866-2268
GARY COPE

SKY SEARCH
CONWAY, SC
(803) 347-4966
SONNY STRICKLAND

SAT. ASSOC. TECH.
HARLINGEN, TX
(512) 425-6657
ROD JOHNSON

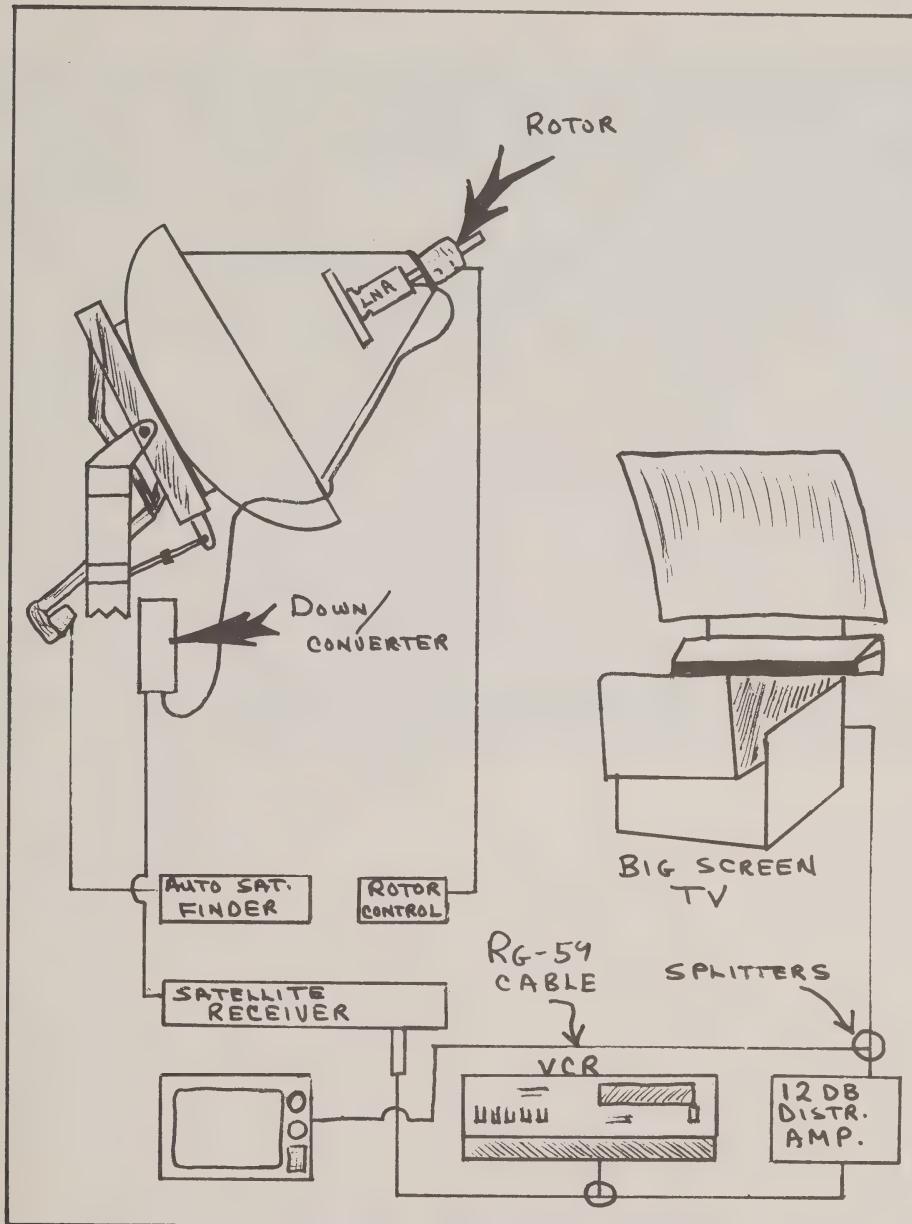
HOUSTON SAT. SYSTEMS
HOUSTON, TX
(713) 784-8953
MIKE KREHEL



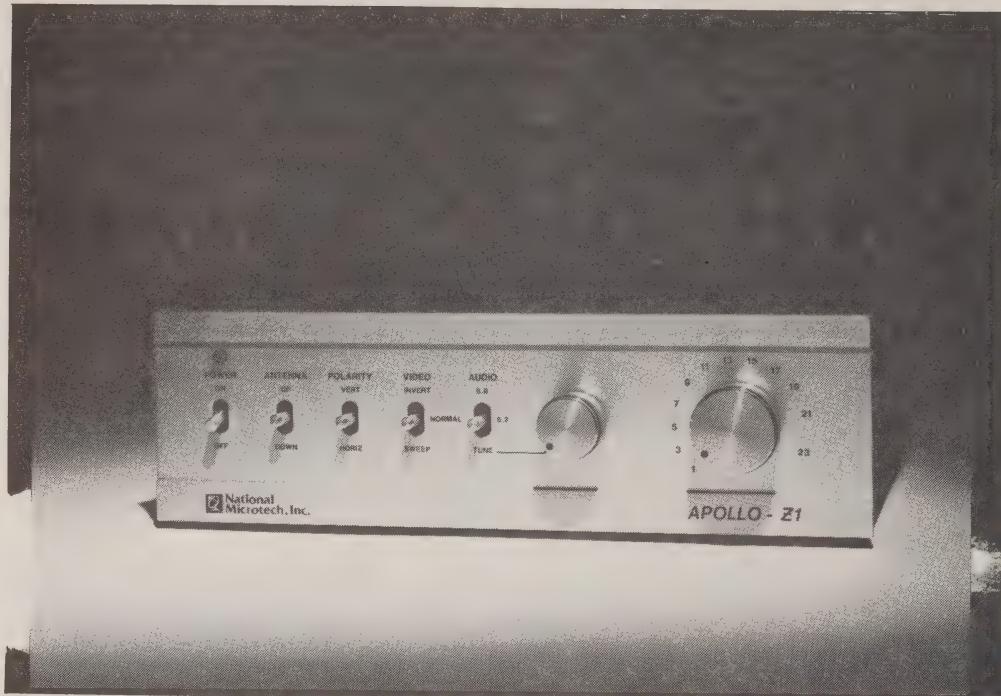
COMTECH Data Corporation

A SUBSIDIARY OF COMTECH TELECOMMUNICATIONS CORP.
350 N. HAYDEN ROAD, SCOTTSDALE, ARIZONA 85257 (602) 949-1155 • TWX 910-950-0085

A TYPICAL SATELLITE HOOKUP



NATIONAL MICROTECH'S APOLLO Z1 RECEIVER



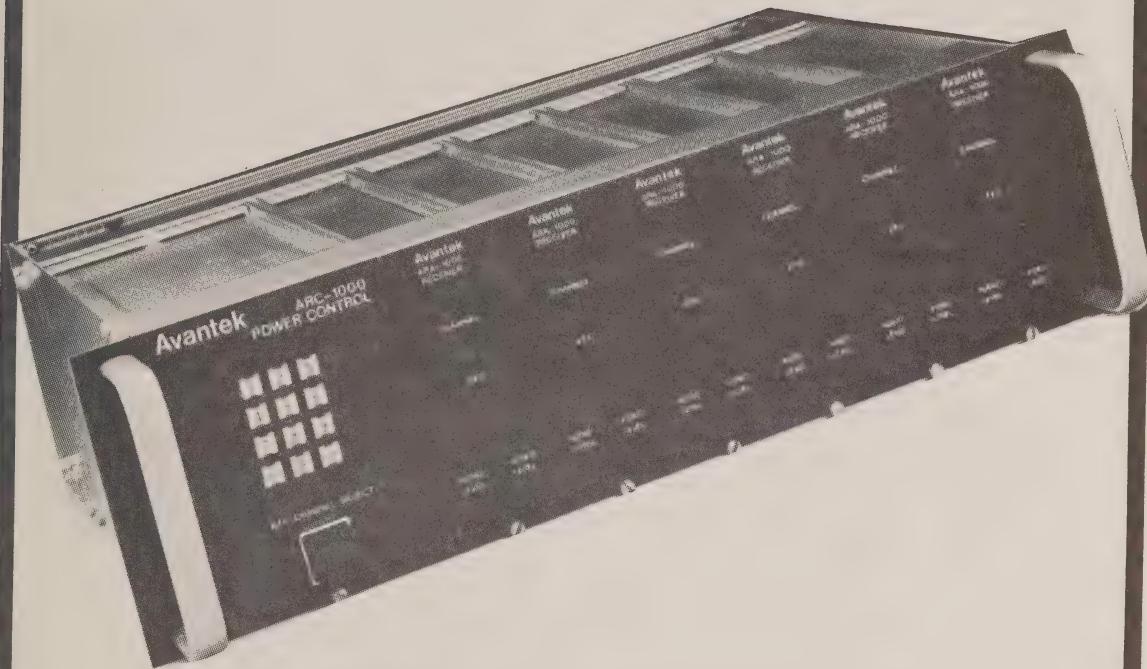
The Apollo Z1 is a unique receiver. Incorporating the latest in state of the art technology, the Apollo Z1 uses a "LNC" (Downconverter built into the LNA) to achieve an excellent cost effective package. If you are not familiar with "LNC" operation, by using the Apollo Z1 this means that you can do away with the downconverter box and run a single RG-59 cable from dish to receiver. Contact Satellite Associated Technology, Interfirst Bank Tower, Suite 612, 222 East Van Buren, Harlingen, Texas 78550 for more information.



AVANTEK'S FANTASTIC SIMULCHANNEL

**Model AR1000 *Simulchannel*™
Earth Station Video
Receiving System, 3.7-4.2 GHz
Revised July, 1982**

Ideal for high grade commercial applications such as apartments, condos, and small housing projects.



FEATURES

- Up to Six Simultaneous Channels Per Receiver System
 - Touch-Pad Digital Tuning
 - Antenna-mounted or Rack-mounted Down-converter
 - Advanced Phase Locked Loop (PLL) Demodulator For Threshold Extension
 - Optional Second Audio Subcarrier Reception
 - Optional Standby Memory
 - Easily Expanded or Reconfigured
 - Automatic Clamp Disable in Sync Suppressed Scrambled Systems.

DESCRIPTION

The Avantek® Model AR1000 *Simulchannel™* satellite earth station video receiving system is specifically designed for performance, reliability and economy in any application requiring "broadcast quality" simultaneous reception of two or more program channels.

A standard system combines the AR1000 receiver with the Avantek ACA-4220 antenna-mounted LNA/Downconverter (LNC). In an earth station configuration using dual-polarized antenna feed, two LNCs and separate horizontal and vertical feedlines, a single AR1000 receiver will provide simultaneous reception of any six satellite-relayed video program channels, with any mix of vertically and horizontally-polarized channels. Four AR1000 receivers may be driven from the same feedlines to provide simultaneous reception of all 24 channels. Figure 1 shows a typical installation of this type.

In operation, the Avantek ACA-4220 LNC translates the full 3.7-4.2 GHz downlink band to a 940-1440 MHz intermediate frequency range as shown in figure 2.

With antenna-feedpoint downconversion only lower-frequency signals are carried on the antenna-to-receiver feedline, therefore lower-cost, more-readily available coaxial cables and RF connectors may be used and long feedline runs become practical.

The 940-1440 MHz IF band was chosen because it lies outside the UHF television broadcast band, in a frequency region occupied only by moderate-power over-the-air signals. This minimizes any possibility of inductive or capacitive coupling of interfering signals into the feedline or the receiver even in metro-

politan and close-in suburban areas where earth stations are frequently located.

An AR1000 mainframe is compact—only 7" high and designed to be mounted in a standard 19" rack, if desired. The receiver mainframe includes one or two six-way power dividers and all backframe connectors and cabling to interconnect the system modules (Figs. 3 & 4).

Each ARA-1001 and ARA-1002 IF receiver module is essentially a complete, digitally-tuned 940-1440 MHz single-conversion video receiver with its own threshold-extension PLL demodulator, automatic frequency control loop, audio subcarrier demodulator (a second audio demodulator is optionally available), and all necessary video and audio signal-processing circuitry. Connectors and terminals on the rear of the module provide access to the 940-1440 MHz IF input, video output, audio output, IF monitor output, composite baseband output and AGC level. The front panel of each module includes an LED channel indicator and adjustments for video and audio output levels. To assure optimum performance and reliability, Avantek manufactured microwave transistors and microwave integrated circuits are used wherever possible throughout the entire AR1000 Simulchannel Satellite Receiver System and related equipment.

The ARA-1001 module is equipped with a single IF-input connector for use in single feedline systems or for dual-feedline systems where manually selecting polarities by shifting cables is acceptable. The ARA-1002 module is equipped with both a horizontal and a vertical input connector, and automatically selects the correct feedline when a channel is programmed.



YOUR NOTES:

AR1000 SIMUCHANNEL BLOCK DIAGRAM

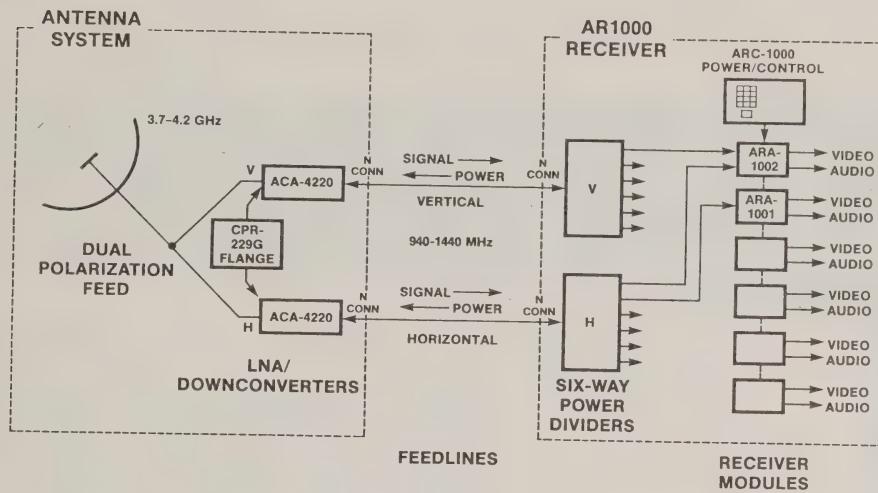
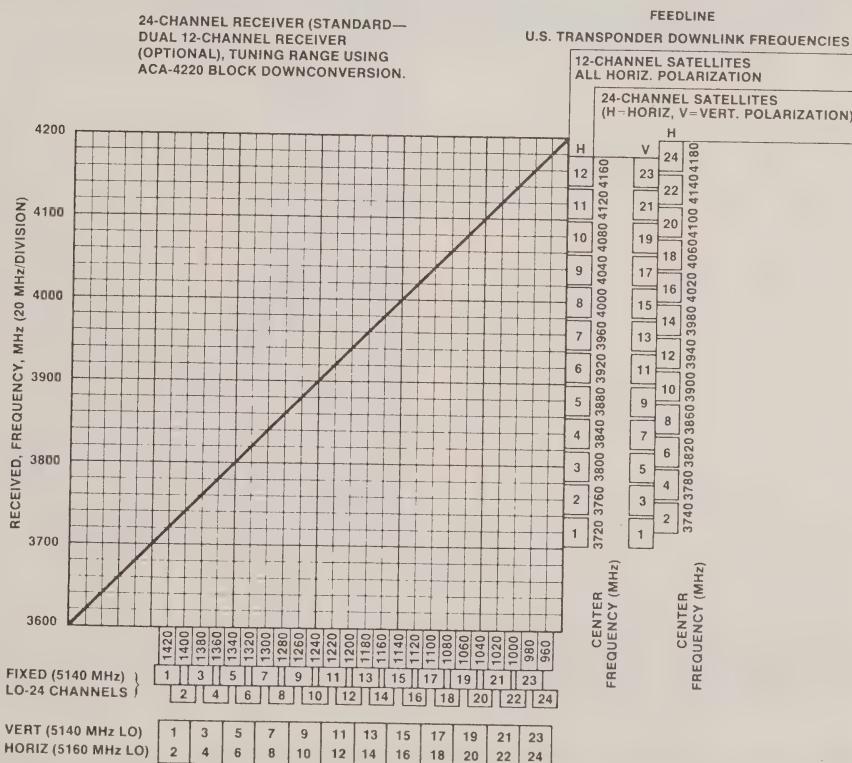


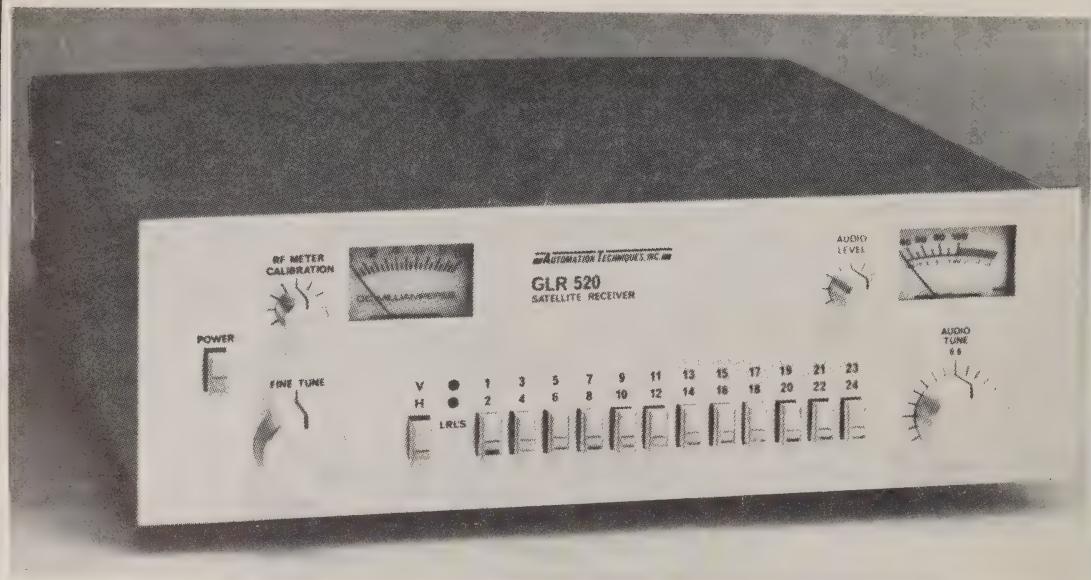
FIGURE 1

Typical earth station configuration using ACA-4220 LNA/Down converters and AR1000 Receiving System.



NEW PRODUCT RELEASE

Automation Techniques GLR-520 Receiver



Never before has the time been more right for the GLR-520, our newest Great Little Receiver. Its exciting distinctive styling, like our GLR-550, is also backed by the proven performance of our GLR-500, the standard of the industry. Some of its great features are:

- One audio channel.
- Push-button transponder selection.
- Relative RF signal meter for constant quality control.
- Weatherized tuning module (downconverter) with LNA power block.
- Unique styling.
- Unfiltered video output.
- Quality modulator with vestigial sideband filter (optional).

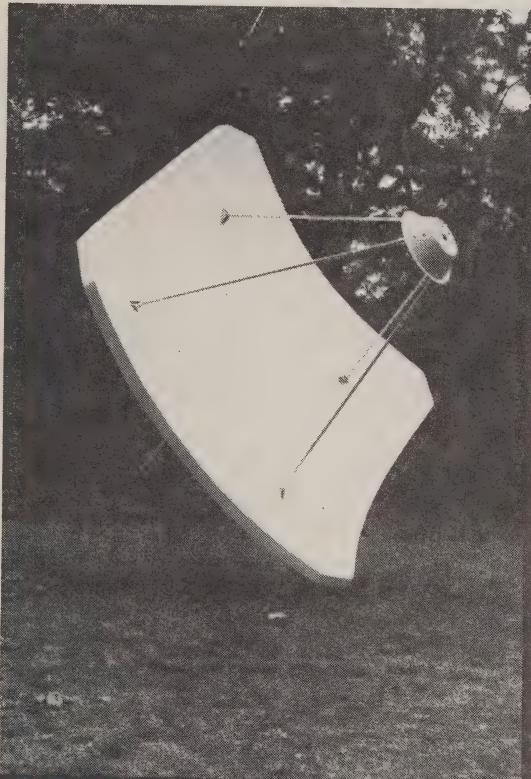
The GLR-520 bridges the gap between the GLR-500 and the GLR-550 because it combines the best qualities of both receivers -- outstanding performance and great styling.

We think you'll agree ... the GLR-520 is another Great Little Receiver.

AUTOMATION TECHNIQUES, INC.

For more information contact: Satellite Associated Technology, Interfirst Bank Tower, Suite 612, 222 East Van Buren, Harlingen, Texas 512-425-6657

Satellite Television



TIRED OF POOR TV RECEPTION

Now you can receive over 60 channels on your own TV, including sports and movies, 24 hours a day from 22,300 miles away.

National Microtech, Inc. continues to sell more home satellite systems than anyone in the world. Microtech's new Apollo X9 is so far advanced over our competition - in features, performance and cost - that we feel Apollo is destined to become a legend in the satellite industry.

Remember, no one sells Apollo but Microtech dealers and distributors.

Authors Note: We have installed several of these systems in south central Texas with excellent results.

Selling National Microtech can be a profitable profession. Contact: Satellite Associated Technology, Interfirst Bank Tower, Suite 612, 222 East Van Buren, Harlingen, Texas 512-425-6657.

National Microtech, Inc. introduces ApolloTM X9 Satellite Antenna \$1995*

*Suggested retail price, LNA and receiver not included. Optional remote satellite finder \$995.



**QUALITY CATV PRODUCTS FROM
THE EXPERIENCED LEADER . . .**



MODEL 550
SATELLITE VIDEO RECEIVER

- DIGITAL TUNING
- REMOTE CONTROL OPTION
- 24 CHANNEL
- SIGNAL STRENGTH METER
- BROADCAST QUALITY PICTURE
- HIGH RELIABILITY
- 8dB THRESHOLD
- LOW POWER CONSUMPTION
- LOW COST
- ONE YEAR WARRANTY

For more information contact:
Satellite Associated Technology
Interfirst Bank Tower, Suite 612
Harlingen, Texas 78550 Tel: 512-425-6657



Bill Wylds of Video Distributing holding the Gyrootor.

Distributor of **Satellite Video Systems & Components**

RECEIVERS: Avcom, Automation Techniques, Equinox, Microwave Associates, Sat-Tec, Comtech

ANTENNAS: ADM, Miralite, Odom.

COMPONENTS: Modulators, Amphenol Connectors, Belden Cable, MATV Components, Remote Dish Drives.

Phone or write for complete dealer pricing. Please furnish tax ID number when writing on your letterhead.



1005-A East Hwy. 83 — McAllen, Texas 78501
512-682-9954 (512-585-0020 home)
Member: International Satellite Distributors Association

BILL'S COMMENTS:

Be sure to check out your components carefully before buying. Ask some of the successful dealers what's working for them.

Give me a call sometime, I'll be glad to chat with you. Keep in mind I stock SAT GUIDE magazine and Rod's SECRET'S OF SATELLITE TV.

DEER, SATELLITE TV, THE GREAT OUTDOORS,
.....and a little cash!



One of the advantages of working in the field.....you never know who you will run in to!! Gentleman with glasses purchased an \$11,500.00 system.



Trees in front of customer's dish had to be trimmed. Say,
how's the deer hunting around here?

FRANK'S COMMENTS ON SELLING



This was an old customer of mine from the period of time when I was selling farm tractors and we already knew each other. I called him on the phone to set up an appointment and this was the conversation we had:

FRANK: Hello, Mr. Smith, this is Frank Strubhart. How are you today?

MR. SMITH: Oh, I'm doing okay Frank, how are you doing?

FRANK: I'm doing great. Are you going to be around this afternoon about 2:00?

MR. SMITH: Yes I will, what are you selling?

FRANK: I have something I want to show you.

MR. SMITH: What is it?

FRANK: I don't want to tell you over the phone, I'll show you when I get there. See you at 2:00 ---Goodbye!

COMMENTS:

Certainly you cannot do this on every sale, but being yourself is important. You know your customers best. How

you present yourself and your product will help you close your sales. Your presentation along with your portable earth terminal and personal contacts will increase your sales. Don't wait until they knock on your door ---knock on theirs.

FRANK: Oh by the way Mr. Smith, will that be cash or check on your deposit?



LEASING SATELLITE SYSTEMS

This is an excellent way to be paid up front for selling a satellite system while making it easier for the customer to conserve his cash flow.

First let me explain a few ground rules about leasing. You should never try to lease a satellite system to someone that you would not want to carry yourself. If you get a bad "track record" with the leasing company -- no more leases.

Below are a couple of addresses of lease companies. You might contact them to find out further information concerning their lease programs for satellite systems:

CONTACT:

Dinah Upshaw
Financial Services
2333 50th
Lubbock, TX 79412
(806) 795-9393

Commercial Equipment Leasing
118 Broadway, Suite 334
San Antonio, Texas 78205 Tel. 1-800-292-7605

SALES CONTRACT

SATELLITE ASSOCIATED TECHNOLOGY

A Division of D&R Enterprises

Interfirst Bank Tower
222 E. Van Buren Suite #612
Harlingen, Texas 78550
Ph. (512) 425-6657



Sold To: _____

TERMS: Cash Down Payment \$

Sub Total

Sales Tax

Labor

TOTAL DUE

Customer's Signature

Page



Some small satellite TV dealers are selling dishes to commercial users. Even with your best mark up you will probably be under the "Big Boys". However, be sure you can deliver the picture they want when you "bid" the job.

For safety reason "hard hats" should be worn while installing heavy mounts and dishes.



Left is a H & R 16 foot mount with center of dish in background.

Above is a 13 foot high performance model with corrected polar mount.



SEE WHAT YOU'VE BEEN MISSING

The Fullview

An out of this world dish
at down to earth prices.

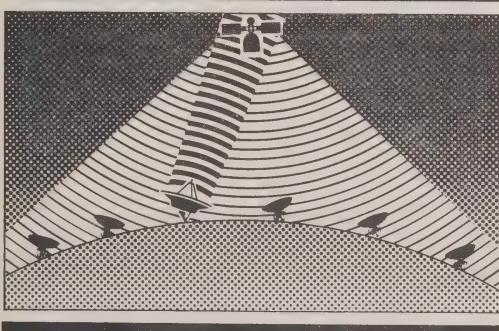
WHY BUY A FULLVIEW ANTENNA?

- 1) EASY TO INSTALL - can be installed by two men in about one hour
- 2) SUPERIOR CONSTRUCTION - the superior design not only means easy installation, but easy operation and high performance
- 3) WILL INCREASE YOUR SALES - Consumers prefer the attractive see-through mesh and are discovering the superior engineering of a mesh dish over a solid dish

Fullview Antenna Co.

Distributed by
Satellite TV Specialists
5665 South State Street
Salt Lake City, Utah 84107

Call us today **TOLL FREE**
800-292-3661



SATELLITE TV SPECIAL *30 minutes in length...*

*Features

- Illustrated News
- Product Introduction
- How To's
- Installation Tips
- Feature Pieces
- Editorials
- Personality Sketches
- Orbit Magazine Features
- The Law and You
- Product Evaluation



5665 South State Street
Salt Lake City, Utah 84107
Call Us Today
Toll Free: **800-292-3661**

SCHEDULE

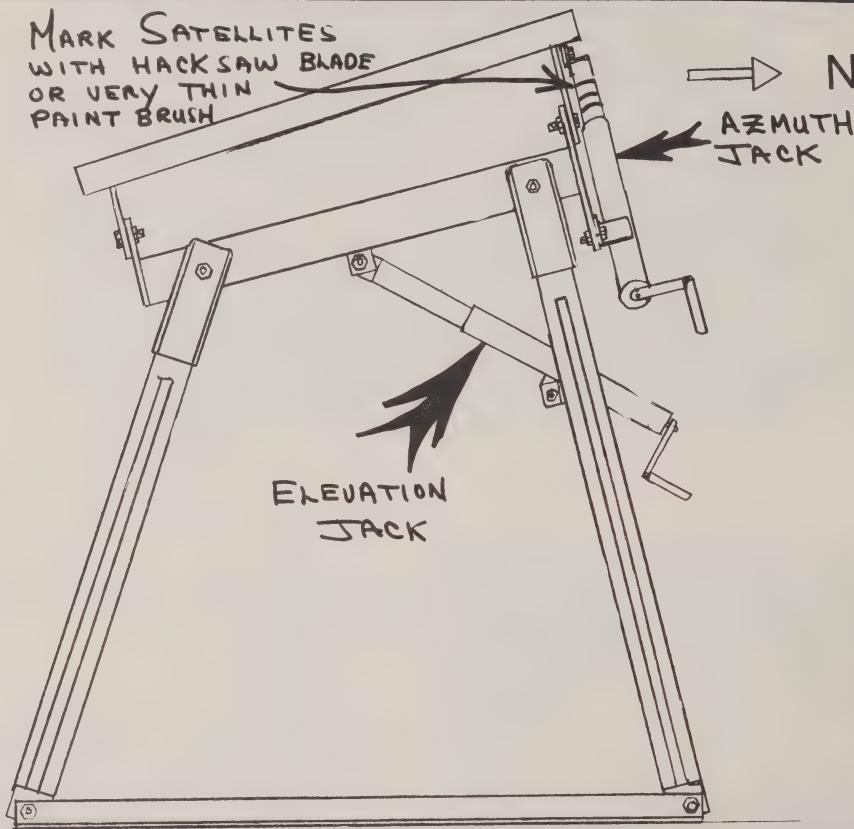
Westar IV	TR 12	Oct. 21	5 - 5:30 EDT**
Westar IV	TR 3	Nov. 4	5 - 5:30 EST**
Westar IV	TR 3	Nov. 18	5 - 5:30 EST**
Westar IV	TR 3	Dec. 2	5 - 5:30 EST**
Westar IV	TR 3	Dec. 16	5 - 5:30 EST**
Westar IV	TR 3	Dec. 30	5 - 5:30 EST**

Program sponsored by Satellite TV Specialists

*Be prepared for video taping

**Repeat (7 - 7:30 EDT)

MAKING A POLAR MOUNT POLAR



The theory is that once the elevation jack is adjusted, then all that is necessary to find the satellites is to move the azimuth jack.

1. Align or point mount as in diagram to true north.
2. Turn receiver to channel 7 (vertical). Turn azimuth to the west until ESPN sports channel shows up. This should be Satcom 3.

Making a polar mount continued

3. If your calculations for elevation and azimuth are correct on Satcom 3 then move the azimuth arm back toward the east until you pick up the National Christian Network (Channel 7 on Satcom 4 before 7:00 P.M.)
4. If your picture is good on both Satcom 3 and Satcom 4 then your mount is polar. If not, then shift the entire mount left or right and reset your elevation jack. Once you get close it is easy to tell which way to shift your mount.
5. A good satellite installer should be able to make a mount polar in about 5 minutes. Don't be disappointed if it takes a long time at first.



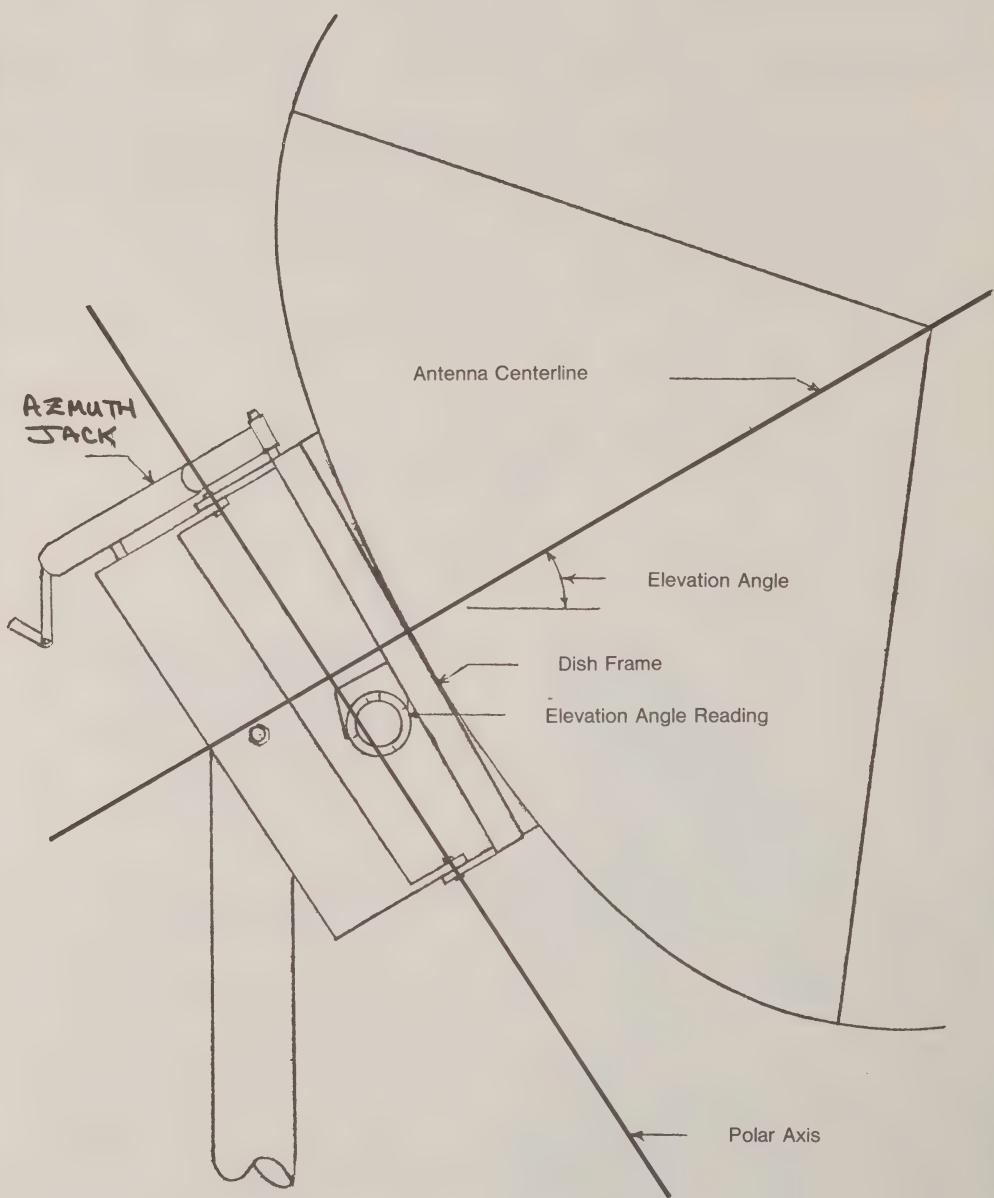
HOW TO RUN A SUCCESSFUL LOW POWER TV STATION

Crash Course
Phoenix-Sept. 25 & 26—Las Vegas-Oct. 30 & 31

New FCC rules open the last great broadcasting opportunity. Any U.S. citizen can now file for a highly profitable neighborhood low-power TV station covering an average of a 15-mile radius. Great programming is readily available via satellite. You can use satellite pay TV, or some new ad-supported satellite networks will pay you to run their programs, or you can do local programs and commercials, if desired. As little as a \$5,000 investment is required to start a station using your video equipment and/or TVRO. Can be profitable in towns as small as 500 people, and you can make a bundle in larger cities. "How to File" manual, including application blanks, \$25. Up-to-date printout of all applications and channels already filed for, \$20. Manual "How to Run a Successful Low-Power TV Station," \$30. Monthly low-power industry magazine, \$50 a year. Photocopies of any specific previously filed FCC application, \$20. Hurry, do not miss out. Fast service on all orders. NOTE: ICTV Alliance will now file applications for you. \$250 and up.

Lo-Power Community TV Publishing
7432 E. Diamond
Scottsdale, AZ 85257
COD orders call (602) 945-6746

CROSSVIEW OF A POLAR MOUNTED DISH



DETAILED INSTRUCTION ON HOW TO MAKE A MOUNT POLAR AND ADJUST ANTENNA

Having obtained the necessary azimuth and elevation values, prepare for the final alignment procedures by locating the receiver and television at the antenna. This makes for much greater ease and accuracy of this endeavor. Check all of the electronic equipment connections for correctness and security and power-up the equipment. The picture should resemble the picture obtained with no antenna connected except with more graininess. If this is not the case, go over all connections again and check for power to all components. Insure that the television is tuned to the channel corresponding to the modular output.

Using the compass, determine in which direction the first satellite lies. The azimuth angle is the compass direction. Turn the antenna in that direction by pivoting it on its polar axis. Most antenna mounting systems have a jack to accomplish this motion. Do not make any adjustments to the first two settings set previously. Monitor the elevation by placing the protractor on the dish mounting frame so that it reads the angle that the dish is pointing above the horizon. Make sure the protractor is vertical or the readings will be erroneous. See Figure 3 for details.

When the proper elevation is reached, check the antenna for stability. Observe the TV picture while tuning through the channels on the receiver. If all the adjustments have been done properly, there should be some resemblance of a picture. It may appear as colored noise or as shifts in the patterns on the screen. Rarely will a watchable picture be obtained without further adjustment. If there is no picture at all, check all alignment parameters for accuracy. If these check out then move the dish slowly with the jack a few degrees in either direction while observing the picture. When the picture shows some programming, continue to move the dish until the reception is the best obtained.

Tune the receiver to the strongest channel observed. Fine tune further by rotating the rotor control to obtain the best picture. Mark the antenna mount positions because they are for reference points.

Move the axis inclination adjustment a discrete amount in one direction while observing the picture. If it improves, continue to move in that direction until the picture is as clear as possible. At this point, move the dish positioning jack to further improve the reception. Work with other adjustments a little at a time to obtain the best reception.

At this time, some fine tuning of the antenna assembly itself is in order. Insure once again that the antenna is stable and will not move freely. Identify the polarization of the programming observed. Turn the rotor control until the vertical polarity channels are observed. Tune in a channel that can be easily identified later. Turn the rotor control to the "S" position. On all systems except the X9, loosen the clamps holding the LNA bracket in the rotor motor and twist the bracket to obtain the best reception on the identified vertical channel. Mark this position for reference on the bracket and rotor. Then slide the bracket so that the LNA moves toward and away from the dish while maintaining the same rotation position. Continue until the best reception is obtained. Tighten the rotor clamps and insure that the LNA cable has room to move freely by moving the button-hook tube within the main tube. The clamps on the rotor motor are not loosened.

Mark the position of the mount so that it may be repeated later. Turn the receiver control to receive the horizontal polarity channels. If the receiver has a scan-tune feature, turn it on at this time. If it does not have scan-tune, the receiver will have to be manually tuned through the full channel range repeatedly while additional satellites are sought.

continued

The polar mount that is included with the antenna system is a marvel of celestial mechanics. Using only one axis for motion, it will accurately track all satellites in the geosynchronous orbit belt above the equator. This makes it the ideal device to use for those earth stations desiring multiple satellite reception. It is also the simplest mount to motorize, requiring only one motor drive.

The correct installation of a polar mount for accurate tracking to the satellite band requires proper alignment of the polar axis. The polar axis is the imaginary line which passes through the two points that the antenna pivots at. See Figure 1.

The proper orientation of the polar axis requires that two exact settings of the mount be made. The first is alignment with true North. True North can be found by: (1) Taking a compass reading at the installation site. (2) Marking the magnetic North/South line obtained by this reading on the foundation pad for reference. And (3) correcting this line to true North using the magnetic deviation factor. The latter can be obtained from your nearest airport flight service facility or tower with the latitude and longitude both of which will be needed later.

Line up the polar axis line with the true North line on the pad. The highest pivot point should be facing North. Do not make any permanent securements at this time because small correcting adjustments are often needed to 'fine-tune' the system. However, do insure that the antenna is stable by adding temporary braces or weights to the mount base.

The second setting is the inclination of the polar axis with respect to horizontal. This angle is approximately the same number of degrees as the latitude of the earth station site. A good tool to use for measurement of this angle is a carpenter's protractor/level, such as the Sears No. 9-3995, which reads directly in degrees of inclination.

Place the tool on a part of the axis adjustment portion of the mount that is parallel to the axis itself. Use the adjusting device provided, jack or turnbuckle, and adjust the axis angle until it corresponds to the latitude angle. Do not make any permanent securements at this time. See Figure 2 for details.

At this time it will be necessary to calculate the remaining parameters. These are the azimuth and elevation angles of the satellites at each end of the satellite band. For this you will need a good calculator with trig and exponential functions. An alternative would be to contact one of the firms offering a printout of the calculations for a fee. Double -check the calculations. An error here could cost hours looking in the wrong place.

D = Earth Station Longitude in Decimal Degrees

A = Earth Station Latitude in Decimal Degrees

S = Satellite Longitude

Use S = 131 first then S = 91

Long. 131 is for Satcom III

Long. 91 is for Westar III

Calculate Azimuths as follows:

B = S - D

AZIMUTH = $180 + \text{ARCTAN}(\text{TAN } B / \text{SIN } A)$

continued

Elevation calculations are more involved:

$$W = \cos B \times \cos A$$

$$C = 90 - \arctan(W/\sqrt{1-W^2})$$

$$Z = 14400 \times \sqrt{3.3864 - \cos C}$$

$$E = (ZxZ - 670886955) / (7914 \times Z)$$

$$\text{ELEVATION} = -\arctan(E/\sqrt{1-E^2})$$

Pivot the dish in the direction of the other satellites that position calculations were obtained for. Do this slowly and observe the picture for signs of reception. When the signs appear, stop and attempt to fine tune the picture using the receiver and positioning jack only. Mark the position on the mount and resume scanning. Repeat this procedure until the location of the second calculated satellite is approximated.

Fine tune the picture on this satellite using the receiver and positioning jack only. If the picture is as good as the picture on the first satellite, no further adjustment is required and the axis alignment and inclination may be permanently secured. All future dish movement will be about the polar axis via the positioning jack. If the picture is not as good, follow the next procedure very carefully. This procedure would also apply if no picture were obtained on this satellite. Except in this case, the dish would need to rotate back to the last satellite that a picture of any nature was observed on.

Change the axis inclination a small amount using the appropriate adjusting device. Observe the picture. If it improved, then the change was in the correct direction. If the picture degraded, then change in the opposite direction. Do only small changes and keep track of this position relative to the original position. If the change decreased the inclination angle, then the base must be rotated counter-clockwise relative to the true North line a small amount to compensate. If the change increased the inclination angle, then the base must be rotated clockwise a small amount to compensate.

Repeak the picture using the positioning crank only. Observe the picture quality. Then rotate the dish to the first satellite position, peak the picture using the jack only, and compare the quality. Repeat the procedure in the previous paragraph if necessary for this satellite and make further adjustments if necessary. Continue this procedure until the picture quality on both satellites is about equal and clear with only the positioning jack being used to move the dish. Permanent securements of the base and inclination adjustments should be made at this time.

If all adjustments described in this document were made carefully and accurately, then all the satellites in the band will be properly tracked by the mounting system. In addition, all future satellites placed in the geosynchronous orbit will also be tracked. Locate each satellite using the scanning method described previously and mark their locations on the positioning jack or in some other location for future reference.

One final note. It will be necessary to make small corrections with the rotor control when moving from satellite to satellite to compensate for the skewing action that this type of mount gives the dish.



AMPLICA MODEL R-10

Satellite Receiver

Input

- Frequency: 70 mHz
- Impedance: 75 ohms Type F Connector
- Sensitivity: -5dBm to -60 dBm

Output

Video

- IF Bandwidth: 28 mHz
- Frequency Response: 4.5 mHz type
- Polarity: Negative Sync.
- Output Level: 1v p-p Nominal
(May be adjusted)
- Output Impedance: 70 ohms
(Type F Connector)
- Scan Rate: 24 Channels

Audio

- Subcarrier: 6.2 mHz, 6.8 mHz
or Variable (5.5 - 9.0 mHz)
- Frequency Response: 40 Hz to 15 KHz
- De-Emphasis: 75 Microseconds
- Impedance/Level: 600ohms
- Harmonic Distortion: Less than 1% Maximum

Metering

- Relative Signal Strength

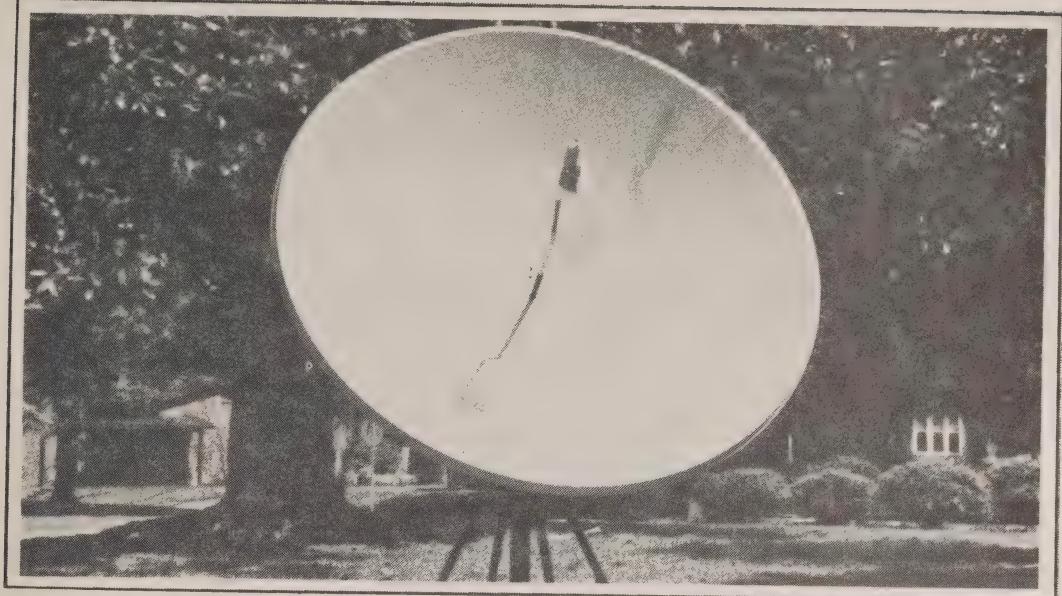
Controls

- Power On/Off
- Video Scan



National Microtech, Inc.

SATELLITE ASSOCIATED TECHNOLOGY
Interfirst Bank Tower — Suite #612
222 E. Van Buren, Harlingen, TX 78550
(512) 425-6657



3.0M (10 ft.) EARTH STATION ANTENNA

APOLLO X10

The Apollo 3.0 meter antennas utilize an eight segment compression molded fiberglass reflector. A prime focus feed locates the LNA at the focal point of both the plane and dual polarized receive only antennas. A prime focus feed of waveguide design is used for transmit and receive antennas.

A polar (hour angle) type mount is supplied with this antenna. This is a true polar mount and is capable of alignment with any visible satellite in the domestic geostationary orbit.

The parabolic reflector is easily assembled of eight identical self-aligning segments. The segments are made from compression-molded fiberglass (FRP) material providing exceptionally high strength to weight ratio.

Specifications

Feed Type PRIME FOCUS

Mid-Band Gain (dB)

Receive	40.1	40.1	39.5
Transmit	—	—	43.0

VSWR 1.2 1.2 1.25

STANDARD FEATURES

- Individual reflector segments are interchangeable and field replaceable.
- Feed can be rotated through 360° of polarization adjustment from the rear of the antenna.
- Segmented reflector significantly reduces size of shipping containers. Provides savings on handling and transportation costs.

- Segments have integral indexing tabs for positive self-alignment.
- Textured front surface diffuses sunlight and reduces solar heating at focal point.
- Antenna can be erected by 2 installers-without the use of cranes or special hoisting gear.

ENVIRONMENTAL

Temperature Range

Operational -40°C to 60°

Wind Loading 0°C (32°F)

Operational 96 km/h(60mi/h)wind

gusting to 136km/h(85mi/h)

Survival 200 km/h(125mi/h)with no ice

140 km/h(87mi/h)with

51 mm(2")radial ice

Meets or exceeds MIL-STD-810B

Atmospheric Conditions:

Impervious to salt, pollutants, and

corrosive contaminants as encountered in coastal and industrial areas

MECHANICAL

Mount Configuration — Polar(Hour/Angle) Aligns to any satellite within the visible geostationary orbit serving the continental U.S.

Reflector — 8 segment fiberglass (FRP), 3.0M (10 ft.) diameter

Shipping Dimensions

National Microtech, Inc.

SATELLITE ASSOCIATED TECHNOLOGY



Interfirst Bank Tower — Suite #612
222 E. Van Buren, Harlingen, TX 78550
(512) 425-6657

Be A Contributing Editor

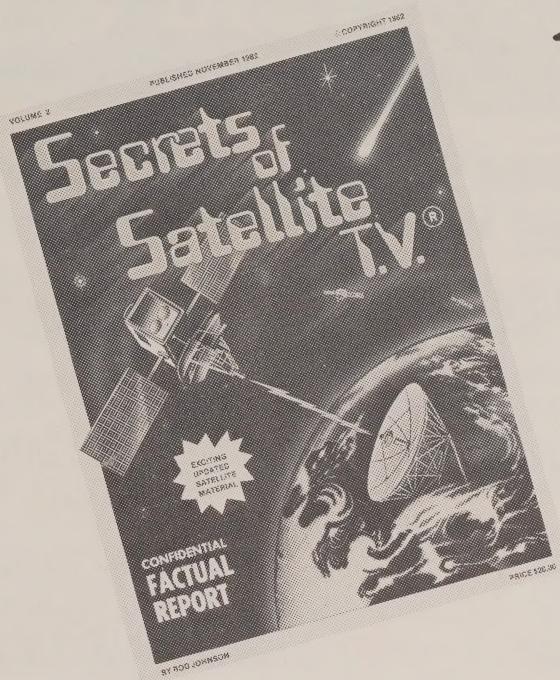
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